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TEMPO

MODEL RADIO COMMUNICATION NETWORK (U.S.S.R.)

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RM 61TMP-50

GENERAL  ELECTRIC

SANTA BARBARA, CALIFORNIA

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XEROX

AFCRL 374

**MODEL RADIO COMMUNICATION NETWORK
(U.S.S.R.)**

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**TEMPO
GENERAL ELECTRIC COMPANY
SANTA BARBARA, CALIFORNIA**

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INTRODUCTION

All material in this report has been obtained from available literature, either in the original Russian or in translation, through Library of Congress or other open sources. The material included carries no expressed or implied intelligence evaluation.

This report may best be considered an essay to establish the geographic distribution and the operating characteristics of the U.S.S. R. radio communications system. The reported system may be a naive representation of whatever system exists. However, it has value in representing one version of the radio communications network required to coordinate civilian and military activities within the Soviet Union. Notably, the report lacks specific inclusions covering military establishments. Very little open source material on this topic has been available since 1957. After a brief exposure to this material it will be clear that many shortcomings exist. This kind of report could be expanded considerably. However, its purpose is to present, in the absence of readily available classified material, some version of the radio communications situation in Russia.

The report, and particularly the five maps, highlights some of the natural areas of expansion dictated by the Soviet Union's climatological and topological characteristics. Because of the unclassified nature of all sources great freedom may be exercised in utilizing this material. Special emphasis has been placed on the Asiatic portion of the Soviet Union, but the most important facilities and new developments in the European portion are also covered. All available information on frequencies, location, and equipment has been included, but material of doubtful validity has been omitted.

SOURCES

The most important source documents used in this report are publications of the International Telecommunication Union (I.T.U.), of which the Soviet Union is a member. Listings of the Telecommunications Radio Stations, with call letters and frequencies, were obtained from these publications.

INTRODUCTION

A very useful Soviet periodical is Vestnik Sviyaze (V.S.), The Communication Revue, from which came information pertaining to radio relay lines and equipment locations and descriptions.

Many other U.S.S.R. publications were used for information, including Bolshoya Sovetskoya Entsiklopediya (B.S.E.), The Great Soviet Encyclopedia. Lesser used publications are cited in the text and all publications, together with abbreviations, are listed in the bibliography or reference lists.

Locations of all the new telegraph offices were taken from Annex 23 of the "List of New Telegraph Offices Open For Public Use After December 31, 1955." In instances where a chain of telegraph offices (creating a line) was not completed, additional material was taken from the "List of Telegraph Offices of 1951." This material was published by I. T. U.

Telegraph stations placed a great distance from wire communications lines may use radio telegraph facilities. Because there is no data other than the name and location, the new telegraph offices are shown on the maps and no separate list is needed. This also concerns the polar stations whose location was taken from the "List of Soviet Polar Stations," published by the Arctic Institute of North America (November 1958). This material is valid to 1956. New material concerning Soviet Polar Stations will be published by the same institute in June 1961.

The locations of the Soviet Meteorological Stations were taken from the "List of Soviet Stations Used During the International Geophysical Year 1957-58," published by the World Meteorological Union. Such stations are shown on the maps only in such locations where no other telecommunication facilities are shown. This list did not include technical information, which is the reason for the lack of separate descriptions.

TRANSLITERATION

In this report, two kinds of transliteration are used, the Standard United States Air Force version and the Swiss version. The latter is employed where material published by the International Telecommunications Union is cited, including locations in lists of frequencies and call letters. An example is Iakutsk, the Swiss version of Yakutsk.

PART 1

GENERAL DESCRIPTION OF U. S. S. R. TELECOMMUNICATIONS

SECTION I
ADMINISTRATIVE-TERRITORIAL STRUCTURE
OF U.S.S.R. COMMUNICATIONS

The present structure of communications in the U.S.S.R. was established in December 1954 when the All-Union Ministry of Communications became the U.S.S.R. Ministry of Communications. At that time Ministries of Communications were also created in each of the union republics. (V.S. No. 1, 1955; p. 3)

The U.S.S.R. Ministry of Communications exercises operational supervision over trunk telephone-telegraph and radio communication networks, broadcasting enterprises and postal services throughout the Soviet Union. The Ministry also oversees construction and operation of U.S.S.R. communication facilities, training of specialists, development of communication plans, promulgation of operating regulations and technical standards, and the introduction of new technology.

The Republic Ministries of Communications, are charged with the direct supervision of communication enterprises located within their borders. This includes such functions as the development of communication networks and enterprises, the operation of the Republic telephone communications and radiofication (rebroadcast) networks and the construction of Republic communication facilities. Furthermore, as communication agencies in the Soviet Union operate under unified plan, the Republic Ministries must operate according to the policies and practices established by the U.S.S.R. Ministry of Communication, which retains full right to suspend or override any contradictory operation or regulation. (V.S., No. 4, 1955, p. 1.)

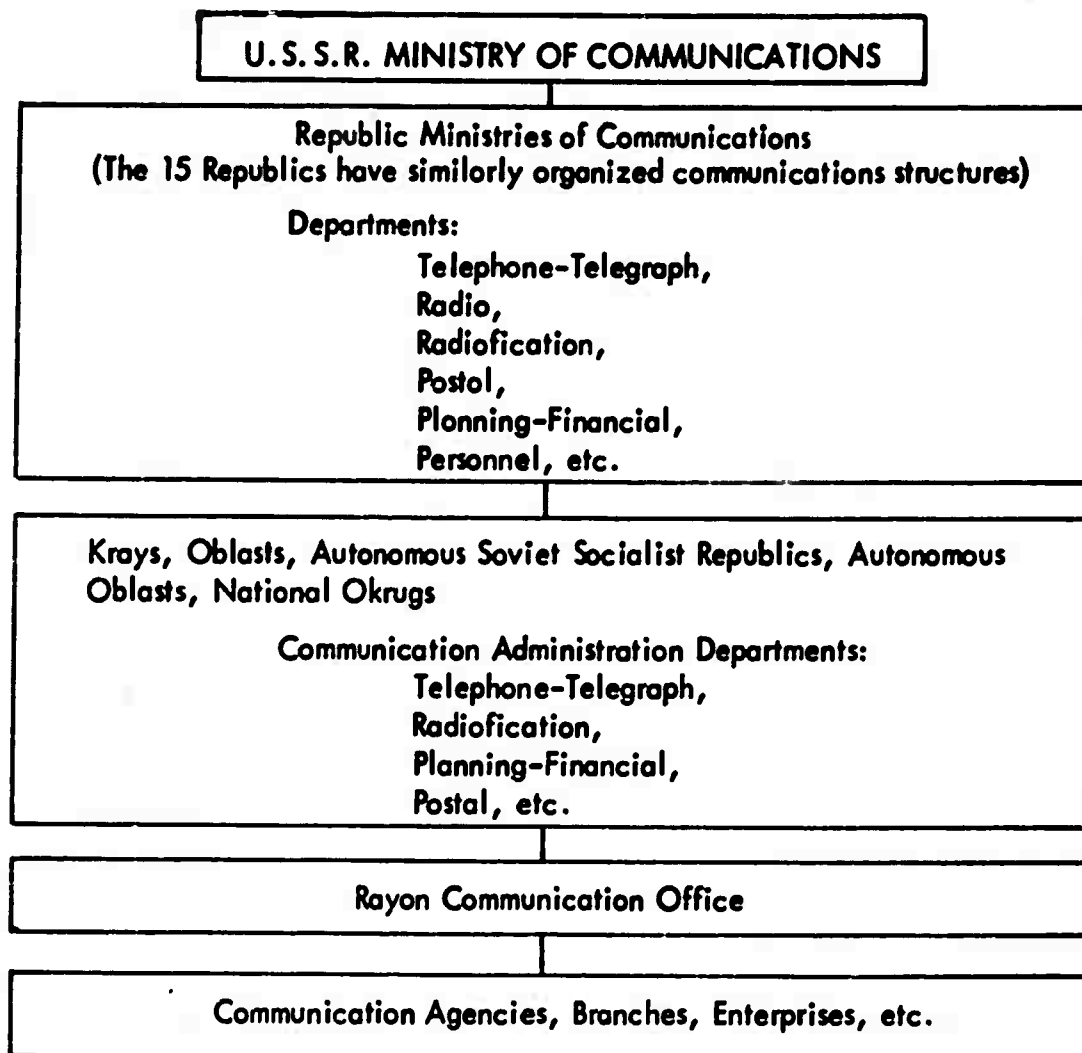
Oblasts and Krays, which are administrative-territorial units into which each republic is divided, maintain communication administrations which are organized into functional departments for the operation of various services such as telephone-telegraph, postal, inter-rayon communications, radiofication (rebroadcast) networks, etc.

SECTION 1

Finally, on the lowest administrative level is found the rayon and city communication offices and various independent agencies, branches and enterprises.

Table 1 outlines these relationships.

Table 1. Administrative-Territorial Structure
of U. S. S. R. Communications



OPERATIONAL STRUCTURE OF COMMUNICATIONS IN THE SOVIET UNION

The foregoing structure of communications corresponds to the administrative-territorial organization of the Soviet Union. The operational structure, however, is organized differently. The principal difference pertains to (1) the operational organization of communication facilities into the zonal center and radial junction systems and (2) the long distance communication lines. Each of these systems transcends administrative boundaries.

The Zonal Center System

The communication zone is the highest operational communication division in the Soviet Union. The Second Five Year Plan (1933-1937) provided that the U.S.S.R. be divided into such communication zones, each with a main or zonal communication center radially linked with all the subordinate stations or points in its zone. The chief engineer of the Central Long Distance Telephone Exchange stated in 1957 that the zonal system was still in effect in the Soviet Union. (V.S. No. 6, 1957, p. 4) Directives of the U.S.S.R. Ministry of Communications reportedly designate the main communication centers and the zones into which they are organized.

Large republic, kray, or oblast cities are generally designated as zonal communication centers; such cities are selected with a view to their administrative-territorial, economic or strategic importance. Soviet sources rarely make direct mention of these highly important zonal centers as such, and not all of them are known. Their existence and location, therefore, must in many cases be ascertained by a consideration of oblique references and other supporting evidence.

A 1940 operational communication plan mentions the following zonal communication centers in the Soviet Union as especially significant: (Krapivner, op. cit., p. 178)

Moscow
Leningrad
Kiev
Kharkov
Rostov
Tashkent

Sverdlovsk
Kuybyshev
Omsk
Novosibirsk
Khabarovsk
Vladivostok
Irkutsk

SECTION 1

The Radial Junction System

The general communications network in the U.S.S.R. comprises both radio and wire communications. The radio, telephone and telegraph communication systems of the network are organized on the radial-junction principle under which all oblast, kray and republic communication centers are directly linked with their zonal centers and in most cases with the Moscow central.

To effect these connections under the radial system, a four-stage arrangement is adopted within the operational area of each communications zone: (1) main zonal communications center, (2) oblast (or kray) communications center, (3) interraxon communications center, and (4) rayon communications center. (Mart'yanov, loc. cit.)

SECTION 2

RADIO COMMUNICATION CENTERS IN THE SOVIET UNION

OPERATIONAL STRUCTURE—RADIO RECEIVING CENTER,
RADIO TRANSMITTING CENTER, RADIO BUREAU

In the Soviet Union, radio is the most extensively developed means of communication. The main radio communications lines throughout the country are linked by specialized radio enterprises organized either as radio centers or their larger versions, directorates of radio communications and broadcasting. These are integrated enterprises consisting of one or more radio transmitting stations, receiving stations, broadcast facilities, etc.; all connected by a radio bureau.

Moreover, the transmitting and receiving stations, often removed considerable distances from cities, usually have complete living facilities for their operating personnel and are then called radio transmitting centers and radio receiving centers. The radio bureau, on the other hand, is usually located in a city. Its function is to connect, control and coordinate the operations of a given radio center with other radio centers and facilities, as well as to provide connections with landline facilities (e.g., long distance telephone exchanges).

These main line centers, or directorates, are established in the chief cities and other strategic points of the Soviet Union to conduct the long distance radio communications. In addition to handling point-to-point radio communications, radio centers serve the main radio broadcasting, television and radio relay networks, as well as radio communication systems operated by other government departments. The sum total of these radio communication facilities, together with the combined landline (telephone and telegraph) networks of the nation, comprises the integrated communication system of the Soviet Union.

SECTION 2

The probable role of the radio center in the U.S.S.R. air defense and warning system should not be overlooked. Radio is the most feasible and effective means for providing a defense warning system. This is particularly true in view of the vast expanses of rugged terrain and sparse population. Such features require that appropriate radio facilities be utilized to tie isolated air defense positions such as the advanced missile and fighter-interceptor bases reportedly on the Chukotsk and Kola peninsulas and along the Soviet Arctic frontier, to main air defense centers deeper within Russia.¹ In view of the relatively low density of communication coverage in most of the country, it is possible that radio centers serve as communication links for this purpose; thus, they would form an integral part of the Soviet electronic defense system.

From the foregoing sketch it is clear that radio center occupies a strategic position in the main line communication system of the Soviet Union. Its strategic importance is based upon the fact that it is almost invariably located in the chief political and industrial cities, and contains the main relay interconnecting and terminal facilities for radio communications. Long communication lines, concentration of facilities, and related features of the U.S.S.R. communication system also enhance the strategic significance of the radio center.

It is essential to understand that a radio center does not exist as a single physical entity but actually is the organization or combination of radio enterprises (operationally and administratively) for radio communication and broadcasting purposes. Thus the association and interconnection of certain facilities —transmitting centers, receiving centers, radio bureaus, television centers, broadcasting facilities, etc., —comprises a radio center.

RADIO RECEIVING CENTERS

Types of Radio Receiving Facilities

In the main U.S.S.R. radio communications system, radio receiving facilities apparently may be organized in several different ways depending on their specific function, amount of equipment, location and other factors.² The following types of radio receiving enterprises have been identified:

1. Radio receiving centers or stations operating under a Directorate of Radio Communications and Broadcasting or a Radio Center. Examples of this type include a radio receiving center operating under the Moscow Directorate of Radio Communications and Broadcasting ³ and a radio receiving station of the Khar'kov Radio Center. ⁴
2. Independent or separate radio receiving stations. The Novosibirskaya Radio Receiving Station is an example. ⁵ Apparently this type of radio receiving facility is not closely associated with other radio facilities, such as those in radio centers. These receiving stations probably serve chiefly as relay facilities. ⁶

Siting of Radio Receiving Centers

The location of a radio receiving facility is recognized as especially critical for proper operation. ⁷

The two chief factors influencing the choice of a site for a radio receiving center reportedly are the absence of interference producing installations and the need for adequate space for antenna arrays. ⁸ For this reason, main line radio receiving centers are generally built at a distance of from 30 to 60 km from large cities and from 5 to 8 km or 15 to 20 km from average size cities. ⁹

All power, telephone and other wires in the vicinity of a radio receiving center are laid in cables, and electrical apparatus is equipped with filters. This is done to reduce possible sources of interference with radio communications. ¹⁰

Organization and Installations

The territory of a radio receiving center is divided into a station area (tekhnicheskaya territoriya) and a housing area (posyelok). ¹¹ All station buildings, antennas, transformer substations, oil and gas storage tanks, guard houses and storehouses are situated within the station area of a receiving center. In the majority of cases all equipment, including the power supply facility, is housed in a single station building, but at large radio receiving centers there are sometimes two or more station buildings. ¹³ When this is the case, such structures are generally spaced 200 or more meters apart, in order to have a large enough area for antenna arrays. ¹⁴

SECTION 2

Frequent expansion, alteration and modernization of radio receiving facilities is taking place as the Soviet Union improves its radio networks.¹⁵ This, in turn, has apparently caused crowding and dislocation of station equipment. Therefore, stations are now being constructed with provision for 25-30% space in reserve for future expansion.¹⁶

If a receiving station has its own power plant installation, the latter is situated at a distance of from 50 to 200 meters from the station building in order to limit interference.¹⁷

Antennas are sited so that all the lines as well as the masts are located within the borders of the station area.¹⁸

A restricted area (control'naya zona) is established for a distance of 200-250 meters beyond the borders of the station area. Anything that will produce electrical interference adversely affecting radio reception is prohibited in this zone.¹⁹

Power Supply

In the Soviet Union, external a-c power networks were, by 1949, recognized as the preferable source of power for radio receiving stations.²⁰ At that time, however, dependable a-c power systems apparently were not widely available or widely used by radio receiving stations. One reason for this was that many receiving stations simply were not equipped with apparatus adapted for such power. Many stations were still using storage batteries which were considered the most reliable power source in view of the unreliable a-c power supply.²¹

A recent (1958) Soviet source states that radio receiving centers are at present fed from the regional a-c power supply network which feeds the radio center.²² In addition, radio receiving centers today may also have their own a-c or d-c power supplies.²³

Antennas

The size of the station area of modern Soviet radio receiving centers is determined mainly by the number and types of antennas. At large receiving centers the antenna array occupies a sizeable area because of the multitude of antennas. For example, a receiving center handling the same number of communication lines as a transmitting

center will have from 2 to 2 1/2 times the number of antennas as the latter. This is because of duplex and triplex operation by the receiving stations. 24

RADIO TRANSMITTING CENTERS

Transmitting facilities for trunk line radio communications in the Soviet Union are organized into radio transmitting stations or centers which are located in the largest administrative and industrial centers of the country. 25

Types of Radio Transmitting Centers

Depending on the specific mission, amount of equipment, location, volume of traffic, and other factors, a radio transmitting facility in the Soviet Union may be organized in several different ways. The following types of transmitting facilities have been reported:

1. Radio transmitting centers operating under a Directorate of Radio Communications and Broadcasting (Direktaiya Radio-svyazi i Radioveshchaniya - DRSV), connected with a radio receiving station and broadcasting equipment and a radio bureau. An example of this type is the transmitting center of the Alma Ata DRSV. 26
2. Independent or separate radio transmitting centers. The Oktyabrskaya Radio Transmitting Center, located near Moscow, is believed to be an example of this type.
3. Radio transmitting centers operating under a Radio Center, connected with a radio receiving station and broadcasting equipment, and a radio bureau. An example of this type is one of the radio transmitting centers of the Moscow DRSV. 27
4. Low-power radio transmitting stations, usually located in a rayon center and part of a combined communications office. 28 Such stations are under an oblast or rayon communications administration and are not directly part of the trunk line communications system. 29

A radio transmitting facility may be a radio broadcasting station, a communications transmitting facility, or the broadcasting and communications facilities may be combined. 30

SECTION 2

Siting of Radio Transmitting Centers

Transmitting stations are built about 30 km from large cities and at a distance from radio receiving stations in order to limit interference.³¹ More specifically, short wave transmitters, which are the the ones most used for long distance communications, are located at varying distances from a city, depending on their power.³²

Physical Layout and Installations

A radio transmitting center comprises the technical, auxiliary and plant facilities designed for the operation of several transmitters.³³ These facilities include transmitters, antennas, power plant, ground system, switching, control, signaling, tube cooling equipment, etc., all located in the station area.³⁴

Large radio transmitting centers are usually equipped with telephone dispatch communications, servicing signal systems and an electric time system.³⁵

Radio transmitting centers are fed from the regional power supply system or may have their own power supply. They also have their own power substations with transformers, switching equipment and protection.³⁶

Antennas

Radio Moscow has a tremendous transmitting center, probably one of the largest in the world, located in a point-to-point and hf broadcast transmitter complex called "Radio Town". This installation has been described by a team of American electronic and communication specialists which recently visited the Soviet Union and toured many of its communication facilities.³⁷

The pertinent part of this description follows:

"The transmitter complex of Radio Moscow is located quite near Moscow, covers hundreds of acres and can best be described as a forest of antennas.

"The point-to-point antenna arrays originate in central switching banks housed in large buildings. In one large building there were 19 radio transmitters ranging from 15 to 100 kilowatts output at hf frequencies up to 27 megacycles. There were 40 antennas, primarily of the rhombic types, and a switching system capable of connecting transmitters in pairs or singly at any frequency to any one of the 40 antennas. In this building the various point-to-point circuits were labeled Paris, London, New York, Rome, Ulan-Bator, Baku, Irkutak, Vladivostok, Arkhangel, Bucharest, Prague, Leningrad, Tashkent, etc.

"In a second building and an adjacent annex there were six broadcast transmitters, each capable of 60 kilowatts and capable of being operated in parallel at 120-kilowatt level at hf frequencies up to 27 megacycles in the regular broadcast bands. There were six arrays of half wave dipoles, 8 x 4, 6 x 4, and 4 x 2, width and height, respectively. These were roughly the same over-all physical dimensions, but were for operation at different frequencies and any transmitters, or pair of transmitters, could be connected to the antennas at a master control board.

"In addition, some antennas were provided with two feeds so that either the full antenna could be operated by paralleling the two halves at the switching house or one half of the antenna could be used to get double the beamwidth. Tapered transmission lines were used as impedance-matching transformers. The switching was performed in an antenna-switching house, to which each of the transmitters was fed and from which the selected antennas were excited. In this house was installed what might be described as the biggest six-bank double Strowger switch that we have ever seen. The switch was remotely controlled from a master control position. The switching arms, about 18 to 20 feet long, were connected to 150 and 300 ohm open-wire transmission lines. The contact was made by pneumatically operated extensions, about 3 feet long, on the end of the switch arm."38

RADIO BUREAU—OPERATIONAL CONTROL AND COORDINATING CENTER

General

The remote siting of radio transmitting and receiving centers, which may be located as much as 30 km apart and up to 60 km from a city, has called for the establishment of a special coordinating radio facility called the radio bureau (radiobyuro).³⁹

A radio bureau serves as the coordinating, operating and control point for any given radio center.⁴⁰ Facilities for servicing trunk line radio communications throughout the U.S.S.R. are concentrated in radio bureaus.⁴¹

A radio bureau is the operations center for the radio communications system, which establishes radio communication connections with radio channel users such as: telegraph operating rooms, long distance telephone exchanges, radio relay lines, etc.⁴²

Direct lines (usually cables) connect a radio bureau with its radio receiving and transmitting centers. In addition, the radio bureau is usually directly connected with other users of trunk line radio facilities: the telegraph office, long distance telephone exchanges, radio broadcasting stations, television centers, and communication agencies belonging to other departments of the government.⁴³

The radio bureaus of certain radio centers may serve as primary or secondary relay points, as well as terminal point facilities for communications. For example, radio bureaus at the Tashkent, Alma-Ata, Novosibirsk, Irkutsk and, soon, Stalinabad, serve both terminal and relay points.⁴⁴ Use of radio relay is slated to increase in order to provide more reliable communications. Therefore, the importance of the radio bureau will also increase.⁴⁵

Location

Radio bureaus are almost invariably located in a city, generally directly adjoining the operating rooms of the telegraph office, which uses its radio circuits.⁴⁶ Occasionally, a radio bureau may be established in one of the buildings of its radio receiving station, or in the communications building (dom svyazi) of a city.⁴⁷

Power Supply

The source of the electric power supply for a radio bureau depends on its location. In a city, power is supplied from the city a-c network,⁴⁸ or from the same source that supplies the telegraph center.⁴⁹ When the radio bureau is located at a radio receiving station, the latter's supply is utilized.⁵⁰

Functions

As the center for providing centralized control over the operation and maintenance of trunk communications lines in any given radio center, the radio bureau exercises the following specific functions.⁵¹

1. radio frequency control
2. selection of antenna, transmitter, receiver, connecting lines, intermediate and terminal equipment
3. maintenance of communications with other stations
4. regulation and adjustment of operation of radio channels
5. radio channel assignment
6. radio channel monitoring
7. faulty operation monitoring
8. frequency shifting and equipment switching
9. communications opening and closing
10. communication equipment shutdown
11. radio relay communications
12. foreign communication lines
13. facsimile lines

SECTION 2

Operation

Through its control facilities the radio bureau makes trunk and connecting radio lines available to all users, such as long distance telephone exchanges, radio relay lines through the long distance exchanges, telegraph offices, broadcasting stations, and others.⁵²

The operation of a radio bureau is the responsibility of the chief operator on duty. He is in charge of all the facilities in a radio center as well as the operation of the radio bureau itself. The chief operator must know the capabilities of the radio center, and must coordinate the operation of all communication enterprises under the jurisdiction of the radio center.⁵³

All the communication enterprises on any given radio trunk lines which are linked by a radio bureau are organized in a definite order of seniority for control over the operation of channels, frequencies, schedules, equipment, etc. Usually the senior station on trunk lines is a directorate of radio communications or a radio center. Consequently, the chief operator of such a senior enterprise is responsible for the operation of all communication stations on that line. Of course, one and the same enterprise may be senior on one line and not on another.⁵⁴

RADIO COMMUNICATION CENTERS, LISTED BY LOCATION AND DESIGNATION

Introduction

Main line radio communication centers are established in the chief cities and other strategic points of the Soviet Union. Their mission is to conduct the long distance radio communications of the U.S.S.R. In addition to handling point-to-point radio communications, radio centers serve the main radio broadcasting, television and radio relay networks in the U.S.S.R. as well as radio communication systems operated by other government departments (military, industrial, maritime, etc.). The sum total of these radio communication facilities, together with the combined landline (telephone and telegraph) networks of the country, comprise the integrated communications system of the Soviet Union.

According to this data, Soviet radio communication centers are characterized by two features which may be strategically significant: (1) they contain the main relay, interconnecting, and terminal facilities for radio communications; (2) they are almost invariably located in the chief administrative and industrial cities of the U.S.S. R.

It is noteworthy that the very factors which contribute to the operational capability and strategical importance of the Soviet radio center also contribute to its operational and strategical vulnerability.

Radio centers may be numbered among the major communication facilities of the Soviet Union, yet they are surely among the least frequently mentioned in available Soviet publications. Even specialized publications dealing with radio and radio communications contain few and guarded references to the function and organization of these primary radio facilities. Even more striking is the sparsity of information with respect to the location and designation of operating radio centers.

The list of radio centers given in this report is not definitive because it is unlikely that all existing radio centers have been reported in available Soviet open sources, or if mentioned, that they have been discovered. It is also to be anticipated that new radio centers will be built, as projected communication plans and needs develop.

Special Features

In connection with the list of Soviet radio centers, certain features and characteristics of the radio communications center should be kept in mind. Briefly, they are:

1. Radio communication facilities include radio communication centers, radio broadcasting centers, television centers, and special-purpose stations. The latter include radio navigation, radar, ionospheric research, etc., facilities.

2. Radio communication facilities are divided into main and interdepartmental communication systems. Main radio facilities are those directly operated by the state for general use of the government and the public. These facilities are under the jurisdiction of the U.S.S. R. Ministry of Communications and the Ministries of Communications of the Union Republics. Interdepartmental radio facilities are operated by and for the exclusive use of various government ministries

and departments, such as the Ministry of Railroads, the Administration for Civil Aviation, The Ministry of the Merchant Marine, etc.

3. It is essential to understand that a 'radio center' as such does not exist as a physical entity. In the Soviet Union, a radio center actually is the organization or combination of certain radio enterprises (operationally and administratively) for radio communication and broadcasting purposes. Thus it is the association and interconnection of certain radio facilities—transmitting centers, receiving centers, radio bureaus, television centers, broadcasting facilities, etc.—that comprise a radio center.

4. The actual radio transmitting and receiving facilities are generally remotod considerable distances (4 to 60 kilometers), depending on the size of the city and the power and type of radio facility. Because of this distance, these radio facilities usually have complete living facilities for their operating and maintenance personnel. In such cases, these radio facilities are called radio transmitting centers and radio receiving centers. Likewise, although radio centers are usually mentioned as being "located" in such-and-such a city, it should be remembered that the actual facilities may be some distance away.

5. Lastly, there is the matter of terminology, the use of the term 'radio center'. Under the Soviet communications system, facilities for radio communications and broadcasting are combined from the administrative and operational standpoints and called a:

- a. Directorate of Radio Communications and Broadcasting (Direktsiya radiosvyazi i radioveshchaniye—DRSV); or a
- b. Radio Center (Radiotsentr—RT), the smaller version of the directorate.

Strategic Communication Facilities

Evidence is accumulating that the Soviet radio center also plays a vital role in other activities of paramount strategic and military significance in the U. S. S. R.

For example, the official organ of the U. S. S. R. Ministry of Communications, Vestnik Svyazi, made the first explicit announcement that Soviet radio centers are used for tracking space vehicles, such as the lunar impacting rocket launched September 12, 1959.

Furthermore, indications are that radio center facilities may be an integral part of the extensive airfield-airline complex.⁵⁸

A study now underway reveals that facilities of the U.S.S.R. Ministry of Communications (including radio centers) are extensively utilized by the enormous network of stations operated by the Soviet Hydro-meteorological Service.

Moreover, an air defense function is strongly implied by the nature and extent of Soviet radio center facilities (e. g., the concentration of radio centers along the western borders of the Soviet Union).⁵⁹

Development of Radio Communication Facilities

A major factor which may be expected to have a significant effect on the location and number of radio centers is the eastward movement in the U.S.S.R. A massive shift of population and industry into the regions east of the Urals has been underway since World War II.⁵⁴ In these regions, radio is a more feasible form of communications than it is in European Russia, where the majority of radio centers are now concentrated. As yet, however, there are no concrete indications of an increase in the number of radio centers located east of the Urals. But the Soviet Government has announced plans for the marked increase of radio facilities in the eastern regions, and this in turn may foreshadow the establishment of radio centers.⁵⁵

Furthermore, the tremendous industrial decentralization program initiated in 1957 should have a profound effect on communication systems and facilities. Based on the establishment of some 105 Sovnarkhozes (economic regions), the new plan will require a vast re-orientation of communication lines and the establishment of an appropriate number of new facilities.⁵⁶ Under these conditions, radio communication facilities can be established more quickly and economically than landline facilities. Consequently the relationship and the requirements for radio centers in connection with the decentralization program is worthy of close attention in the future.

These major factors may be expected to influence the future development of radio communication facilities.

The locations of the Soviet Radio Communications Centers are given in the respective sections of this report and are shown on the maps.

List of References

1. IR 1380-58 Communication in Soviet Far East.
2. BSE, 2nd ed., 1955, v. 34, p. 497-498; Adamskiy, op. cit., p. 11, 427.
3. Vestnik Svyazi, No. 12, 1955, p. 22. Hereafter cited as V.S.
4. V.S., No. 11, 1955, p. 26.
5. V.S., No. 5, 1957, p. 21-22.
6. V.S., No. 5, 1957, p. 21-22.
7. V.S., No. 7, 1955, p. 7.
8. Adamskiy, op. cit., p. 7, 404; BSE, 2nd ed., 1955, v. 34, p. 490.
9. Adamskiy, op. cit., p. 405; BSE, 2nd ed., 1955, v. 34, p. 497.
10. BSE, 2nd ed., 1955, p. 34, p. 438; Adamskiy, op. cit. p. 7; Iodko, op. cit., p. 337.
11. Adamskiy, op. cit., p. 404.
12. Adamskiy, op. cit., p. 424.
13. Adamskiy, op. cit., p. 8, 424; Iodko, op. cit., p. 337-338.
14. Iodko, op. cit., p. 338.
15. V.S., No. 2, 1954, p. 9.
16. Iodko, op. cit., p. 339.
17. Adamskiy, op. cit., p. 424.
18. Ibid.
19. Adamskiy, op. cit., p. 11, 384.
20. Adamskiy, op. cit., p. 384-385, 373.
21. Iodko, op. cit., p. 210-211.
22. BSE, 2nd ed., 1955, v. 34, p. 495.
23. Adamskiy, op. cit., p. 404, BSE, 2nd ed., 1955, v. 34, p. 490.
24. BSE, 2nd ed., 1955, v. 35, p. 560; Iodko, op. cit.
25. V.S., No. 5, 1955, p. 22; Ibid., No. 9, 1948.
26. V.S., No. 10, 1955, p. 17.
27. Iodko, op. cit., p. 180, 330.

28. Iodko, op.cit., p. 217, 329.
29. BSE, 2nd ed., 1955, v. 32, p. 398.
30. BSE, 2nd ed., 1955, v. 34, p. 495; Adamskiy, op.cit., p. 7.
31. Iodko, op.cit., p. 47; Adamskiy, op.cit., p. 419.
32. BSE, 2nd ed., 1955, v. 32, p. 598.
33. BSE, 2nd ed., 1955, v. 32, p. 391.
34. BSE, 2nd ed., Moscow, 1955, v. 32, p. 398.
35. BSE, 2nd ed., 1955, v. 32, p. 398.
36. Signal, op.cit., January 1958, p. 12-14.
37. Signal, op.cit., January 1958, p. 14.
38. Iodko, op.cit., p. 17, 363; Adamskiy, op.cit., p. 405; BSE, 2nd ed., 1955, v. 34, p. 497.
39. Iodko, op.cit., p. 342.
40. BSE, 2nd ed., 1955, v. 35, p. 506.
41. Iodko, op.cit., p. 342.
42. BSE, 2nd ed., 1955, v. 35, p. 560; Adamskiy, op.cit., p. 6-7; Iodko, op.cit., p. 18; V.S., No. 3, 1956, p. 4.
43. V.S., No. 11, 1956, p. 31.
44. V.S., No. 1, 1957, p. 31.
45. BSE, 2nd ed., 1955, v. 35, p. 506; Adamskiy, op.cit., p. 7.
46. Iodko, op.cit., p. 342.
47. Iodko, op.cit., p. 217.
48. BSE, 2nd ed., 1955, v. 35, p. 506.
49. Iodko, op.cit., p. 343.
50. V.S., No. 11, 1956, p. 30-31; V.S., No. 1, 1957, p. 30; BSE, 2nd ed., 1955, v. 35, p. 506.
51. BSE, 2nd ed., 1955, v. 35, p. 503; V.S., No. 1, 1957, p. 30; V.S., No. 5, 1956, p. 16.
52. V.S., No. 11, 1956, p. 31.
53. Iodko, op.cit., p. 364; Adamskiy, op.cit., p. 319.

LIST OF POINT TO POINT RADIO COMMUNICATION CHANNELS

Point to Point Radiotelegraph Channels.

From	To
Tashkent	Kabul (Afganistan)
Moscow	Tirane (Albania)
Moscow	Vienna (Austria)
Moscow	Bruxelles (Belgium)
Moscow	Rio de Janeiro (Brazil)
Moscow	Sofiya (Bulgaria)
Moscow	Peking (China)
Moscow	Shanghai (China)
Irkutsk	Peking (China)
Irkutsk	Shanghai (China)
Moscow	New York (USA)
Moscow - Tanger -	New York (USA) Second circuit.
Moscow	Paris (France)
Moscow	Budapest (Hungary)
Moscow	New Delhi (India)
Moscow	Teheran (Iran)
Moscow	Tel Aviv (Israel)
Moscow	Rome (Italy)
Moscow	Begrouth (Liban)
Moscow	Ulan Bator (Mongolia)
Irkutsk	Ulan Bator (Mongolia)
Moscow	Oslo (Norway)
Moscow	Karachi (Pakistan)
Moscow	Berlin (East Germany)
Moscow	Bucuresti (Romania)
Moscow	London (Great Britain)

Point to Point Radiotelephone Channels.

Moscow	Shanghai (China)
Moscow	Peking (China)

Moscow
Moscow
Moscow

Poona (India)
Ulan Bator (Mongolia)
London (Great Britain)

Source: (All A-M stations) I. T. U. List of Point to Point Radio Communication Channels, 1955

Moscow

Kabul (Afghanistan)
Source: Kharakhstanskaya Pravda,
Feb. 25, 1959.

Moscow

Hanoi (Laos)
Source: Izvestia, Feb. 1, 1959.

LIST OF SHIPS USED FOR METEOROLOGICAL SERVICE

(Source: World Meteorological Union), List of Ships in Meteorological Service as of January 1, 1960)

Broadcasting frequencies for U.S.S.R. Meteorological ships are only given in terms of wave lengths. According to G.B. Belotserkovskiy's book, "Antenny", U.S.S.R. frequencies are divided as follows:

M — Medium waves, 200–3000 meters, 1500–100 kc, lf and mf.
S — Short waves, 10–200 meters, 30–1.5 mc, mf and hf.

The areas or routes on which the ship is normally plying, are denoted by the reference numbers in the list:

- | | |
|---------------------------|-----------------------|
| 1. Pacific Ocean | 10. North Sea |
| 2. Indian Ocean | 11. Baltic Sea |
| 3. Atlantic Ocean | 12. Mediterranean Sea |
| 4. North Atlantic | 13. Black Sea |
| 5. Greenland Sea | 14. Bering Sea |
| 6. Norwegian and Kara Sea | 15. Sea of Japan |
| 7. Barents Sea | 16. Sea of Okhotsk |
| 8. White Sea | 17. East-Chinese Sea |
| 9. Arctic Seas | 18. No fixed routes |

LIST OF SHIPS USED FOR METEOROLOGICAL SERVICE

<u>Name of Ship</u>	<u>Wave Length</u>	<u>Name of Ship</u>	<u>Wave Length</u>
A. Mozaiskij	S 1, 15, 16	Erevan	S 1, 14, 15, 16, 17
Adm. Usakov	S 18	Frunze	S 18
Aivazovskij	S 1, 15, 16	Gatoina	MS 10, 11
Akademik Berg	S 4	Gidrolog	S 15, 16
Akademik Krylov	S 18	Gor'kij	S 18
Aleut	S 1, 14	Gorodeckij	S 4
Altai	S 15, 16, 17	Griboedov	S 10, 11
Amderma	S 1, 14, 15, 16	Grigorij Vaku-	
Angarsk	S 18	lencuk	S 18
Antarktika	S 14	Groznyj	S 18
Aral'sk	S 5, 6, 7, 8	Har'kov	S 7, 18
Argun'	S 4	Herson	S 18
Arhangel'sk	S 4, 6, 7, 8	I. Kulibin	S 1, 14, 15, 16, 17
Ashabad	S 4, 18	Il'men'	S 1, 13, 16
Askold	S 18	Irkutsk	S 4, 18
Atkarsk	S 18	Istra	S 18
Atlantika	S 4	Ivan Moskvina	S 18
Azija	S 1, 15, 16	Ivan Pavlov	S 18
Babaev	S 4	Ivan Polzunov	S 18
Bajan	S 4	Ivan Secenov	S 18
Baku	S 1, 14, 15, 16, 17	Izevsk	S 18
Balhas	S 1, 15, 16	Jakutsk	S 1, 14, 15, 16
Baltiysk	S 1, 14, 15, 16, 18	Kahouka	S 18
Baltika	S 10, 11	Kamenec-	
Belorussija	S 18	Podol'skij	S 1, 14, 15, 16, 17
Borodin	S 1, 14, 15, 16	Kamensk	S 6, 10, 11
Budennovsk	S 1, 14, 15, 16, 17	Karl Marks	S 18
Celjuskinec	S 18	Kasirstroi	S 1, 14, 15, 16, 17
Cernjahovsk	S 1, 14, 15, 16	Kirov	S 18
Dal'nevostoonik	S 15, 16	Kirovsk	S 18
Dekabrist	S 1, 2, 3	Klaipeda	S 7
Dmitrij Donskoi	S 18	Kolhoznik	S 18
Dnepropetrovsk	S 15, 16, 17	Kolomna	S 7, 10, 11
Dnestr	S 3, 9, 12	Komsomol	S 18
Dovator	S 4	Korablestroitel	S 4
Dzurma	S 1, 14, 15, 16, 17	Korsakov	S 1, 14, 15, 16
Eniseisk	S 1, 14, 15, 16	Kovda	S 5, 6, 7, 8
		Krasnogvardeec	S 1, 14, 15, 16, 17

List of Ships Used For Meteorological Service (Continued)

<u>Name of Ship</u>	<u>Wave Length</u>	<u>Name of Ship</u>	<u>Wave Length</u>
Krasnojarsk	S 1, 14, 15, 16	Okeanolog	S 8
Kronstadt	S 1, 2, 3	Osmussar	S 15, 16
Krym	S 18	Otkupščikov	S 7
Kuban'	S 18	Otto Smidt	S 18
Kulu	S 1, 15, 16	P. Kamcatskij	S 1, 14, 15, 16, 17
Kuzbass	S 1, 14, 15, 16, 17	Pamir	S 1, 14, 15, 16, 17
L. Krasin	S 15	Pamjati Kirova	S 4
Leningrad	S 18	Penza	S 18
Leninogorsk	S 18	Persei-2	S 7
Leninsk	S 18	Pinagor	S 5, 6, 7, 8
Leonid Leonidov	S 18	Pinsk	S 1, 14, 15, 16
Lunacarskij	S 1, 14, 15, 16, 17	Pobeda	S 18
Mahac-Kala	S 18	Poti	S 7
Majkop	S 18	Pravda	S 3, 9, 12
Marsal Govorov	S 18	Priozersk	S 3, 9, 12
Mendeleev	S 18	Privolzsk	S 3, 9, 12
Mezen'	S 5, 6, 7, 8	Professor Mes-	
Micurin	S 18	jacev	S 4
Micurinsk	S 18	Professor Popov	S 18
Mihail Kalinin	S 18	Pakov	S 18
Mikluha-Maklai	S 1, 14, 15, 16, 17	Pulkovo	S 10, 11
Mirgorod	S 1, 14, 15, 16	Rjazsk	S 15, 16
Mirnyj	S 7	Rodina	S 1, 14, 15, 16
Mogilev	S 8, 9, 12	Rossija	S 4
Moiodecno	S 18	Rostov	S 18
Mosdovskij		Rus'	S 1, 15, 16
Festival'	S 18	Samarkand	S 18
Moskva	S 18	St. Bol'Sevik	S 1, 14, 15, 16, 17
N. Burdenko	S 18	Sergej Botkin	S 18
Nekrasov	S 4	Sergej Kirov	S 18
Nemirovio-		Sever	S 4
Dancenko	S 18	Severodvinsk	S 4, 5, 6, 7, 8
Nerpa	S 4, 6, 7, 8	Simferopol	S 7
Nikopol'	S 7	Sivas	S 10, 11
Noril'sk	S 1, 14, 15, 16, 17	Soci	S 3, 9, 12
Novgorod	S 1, 14, 15, 16, 17	Somov	S 4
Ocakov	S 18	Sovetskaja	
Oka	S 15, 16	Gavan'	S 18

SECTION 2

List of Ships Used For Meteorological Service (Continued)

<u>Name of Ship</u>	<u>Wave Length</u>	<u>Name of Ship</u>	<u>Wave Length</u>
Sovetskij		Volga	S 3, 5, 6, 7, 8, 9, 10, 11, 12
Sojuz	S 1, 15, 16	Volgoneft'	S 13
Stalin	S 18	Vorkuta	S 4
Stalinabad	S 18	Vorosilovsk	S 1, 15, 16
Stalino	MS 15	Vycegda	S 1, 14, 15, 16
Stanislavskij	S 18	Vytegra	MS 3, 9, 12
Stavropol'	S 5, 6, 7, 8, 18	Zan Zores	S 18
Stepan Razin	S 1, 14, 15, 16, 17	Zapad	S 4
Sucan	S 1, 2, 3	Zapadnaja Dvina	MS 3, 9, 12
Suhona	S 18	Zdanov	S 18
Sulin	S 7	Zelenec	S 4, 6, 7, 8
Sverdlovsk	S 18	Zelenogorsk	S 1, 14, 15, 16
Svetlogorsk	S 1, 14, 15, 16	Ziguli	S 13
Tambov	S 4	Ziguljevsk	S 4
Taras Sevcenko	S 18		
Tobol'sk	S 1, 14, 15, 16, 17		
Tolstoj	S 1, 14, 15, 16		
Topseda	S 7		
Treska	S 7		
Turgenev	S 1, 14, 15, 16		
Ufa	S 1, 14, 15, 16		
Uglegorsk	S 1, 14, 15, 16		
Vaga	S 1, 14, 15, 16		
Vaijan-Kutjur'e	S 1, 14, 15, 16, 17		
Vasilij Kacalov	S 18		
Vetluga	MS 15		
Vilnjus	S 10, 11		
Vitebsk	S 1, 4, 14, 15, 16, 17		
Vitjaz'	S 1, 2		
Vladivoskok	S 1, 2, 3		

SECTION 3

ANTENNAS IN THE SOVIET UNION

In this report the various types of antennas have been classified according to the Soviet classification system, i. e., by wavelength (medium, short and ultra-short). Therefore, transmitting and receiving antennas are not treated nor described separately but rather in accordance with the above classification system. It may be noted that in the centimeter and millimeter range, identical antennas are used for transmission and reception, while in radar application very often one and the same antenna is used for both phases of operations.

There is currently a great deal of interest being shown by military and civilian organizations in the U.S.S.R. in super-high-frequency antennas used for microwave communications and radar applications.

By applying wide-band techniques, the Soviets have developed an antenna system which can handle television simultaneously with a large number of telephone channels, using microwave type of transmission. Several microwave-type antennae described here are rather similar to U.S. types.

The best examples of transmitting antennas used in point to point communication are perhaps the ones employed by Moscow Radio. This center has an extensive antenna field consisting of 40 transmitting antennas, primarily of the rhombic type, with a switching system capable of connecting transmitters in pairs or singly at any frequency to any one of the 40 antennas. In addition, six arrays of half wave dipoles are linked to the broadcast transmitter.¹ The receiving antennas of this center are the "travelling wave" curtain array type.² These are divided into day and night antennas.

Many of the antennas are very similar to types currently used in the United States with slight modifications. However, certain types are distinctively Soviet in origin, designed for multi-purposes such as for radio communications, broadcasting, etc. These antennas are

SECTION 3

usually of the wide-band variety, covering a wide range of frequencies. Good examples of these types are the "Nadenenko" dipole and the V-type, wide-band antenna, designed by A.A. Pistol'kors, which are extensively used by radio stations in the U.S.S.R.

It is important to state that the NII (Scientific Research Institute of the Ministry of Communication) has a section on antennas which deals with design and construction of antenna system. This section consists of many Soviet antenna experts who work closely with other scientific organizations, etc., that deal with antenna and related problems. In addition, the antenna section of the A.S. Popov Society, under the direction of A.P. Vol'pert, also works on intricate antenna problems, rendering reports, etc., on subjects of theory, etc. It also acts in an advisory capacity to the NII.³ This section at the annual conference of the A.S. Popov Society usually briefs the members on new developments in the antenna field in the U.S.S.R. and elsewhere.

GENERAL INFORMATION

The types of antennas used depend on the purpose for which they are designed. Soviet antennas are classified according to the frequency bands and wave lengths they are used on, as follows:⁴

long waves	3000 to	30,000 meters
medium waves	200 to	3000 meters
short waves	100 to	200 meters
ultra short waves	10 to	100 meters
(a) meter waves	1 to	10 meters
(b) decimeter waves	10 centimeters to	1 meter
(c) centimeter waves	1 centimeter to	10 centimeters
(d) millimeter waves	1 millimeter to	1 centimeter

Antennas of each frequency band are, therefore, divided into long, medium, short wave and super-high-frequency antennas. Long and medium wave transmitting antennas are further divided into wire, mast and tower antennas, short wave transmitting antennas into tuned and wide-band antennas and super-high-frequency into halfwave dipoles and ground plane antennas. In addition, the latter antennas are classified according to whether they are non-directional, low-directional or high directional types. The same breakdown also applies to receiving antennas, with some exceptions.

According to the directives of the XXth Congress of the CPSU on the 6th Five Year Plan (1956-60), it was planned to develop microwave radio relay communications using very high frequencies. In consequence of this announcement much attention has been devoted to microwave antenna installations in the last few years.

It has been reported that at the present time various types of high frequency antennas, such as parabolic, reflector, slot, dielectric lens, wave duct, etc., are being used in the U.S.S.R. Many parabolic reflector antennas are being used widely by ships; radar, horn antennas are being employed by aircraft and ground radar stations, etc., wave duct antennas are being used by television stations, etc.⁸

SHORT WAVE ANTENNAS

The short wave band which covers the 10-200 m wavelength range is presently the most important in the field of long distance radio communications. These wavelengths are also used in radio broadcasting for long distance.⁹ Using sky waves and relatively low powered transmitters, signals can be transmitted up to 10,000-20,000 km.¹⁰

A characteristic feature of short wave antennas is their flexibility. These antennas are the most widely used in the U.S.S.R. and can be adopted for all radio wavebands.¹³

Among the number of special requirements which short wave antennas have to fulfill is the necessity for lowering the influence of long distance fading. In order to create this ideal situation; a system of spacing antennas is necessary. These antennas are connected to a receiving center, and are spaced at certain set distances from the center.

The central idea being that when the electric field is lowered because of fading in one antenna it will be compensated by a gain in the other antennas, thus resulting in better reception at all times.¹⁵

One of the most prevalent antenna types used in the U.S.S.R. is the half-wave antenna or so-called dipole. As mentioned previously, this short wave antenna can be suspended either horizontally or vertically, depending upon the type of polarization desired.¹⁶

In practice, however, the horizontal symmetrical dipole types are preferred since they do not have to have good ground conductivity, nor any special location, nor a tall mast for reinforcing antenna conductors. Besides these antennas have a horizontal radiation pattern; and such receiving antennas are not subject to industrial interferences.¹⁷

The example of a dipole antenna is one which is used on 10 to 60 m wavelengths. The horizontal conductor is divided into 2 equal parts. The length of each half is equal to $1/4$ to $5/8$ wavelengths. The horizontal conductor has insulators on the ends. The dipole is linked to the transmitter by a two wire line which is the feeding line.¹⁸

A design of a vertical dipole with a lowered characteristic impedance is known as an unbalanced dipole type.¹⁹ The antenna consists of several vertical conductors, forming a cylinder. The conductors are linked to the base of the mast and are connected to the coaxial feeder line. The conductors are insulated from the mast. The required characteristic impedance of the antenna is ensured by choosing the proper cylinder diameter.²⁰

One of the popular types of dipoles used in the U.S.S.R is the "Nadenenko Dipole". This is a so-called "heavy gauge" balanced dipole, which consists of conductors arranged in a cylindrical form tapering into a cone, with the ends linked to the feeder line. This antenna has a small characteristic impedance. With the diameter of the cylinder 1 m, length 20 m, and the wavelength 30 m, the impedance will be 300 ohms. This antenna, in addition to operating independently can also be an element of a multi-dipole antenna.²¹ Each arm of this dipole consists of 4-8 conductors (wires) which are attached to the metallic wings. The arms are connected to the feeder lines which in turn are linked to the radio station.²² This type increased the band width because it lowers the characteristic impedance. In addition to S. I. Nadenenko, V. V. Tatarinov, and V. N. Kessenikh, and others have similarly developed this principle for dipoles, which is being utilized on superhigh frequencies.²³

The above-mentioned "Nadenenko" dipole, in addition to being cylindrical can also take a conical, cigar-shaped, or an oval-shaped form.²⁴

The selection of the dipole antenna type to be employed is determined largely by design considerations and the required frequency band to be used.²⁵

The Moscow Radio Short-Wave Broadcasting Station, having a 150 kw power, employs antennas designed by Minks. This antenna type has 2 identical half antennas, each of which receives half the station power from separate units of the transmitter. Each half antenna is mounted on a separate metallic tower, which has 4 tiers consisting of 4 active half-wave elements and 4 half-wave passive reflectors. The distance between active and corresponding passive elements is equal to 0.2 (wavelengths). The antenna elements are excited in phase. With the elements in cophased excitation the antenna then reverts to the required radiation pattern, which in a horizontal plane has a basis lobe with a width of the order of 35 degrees. The Moscow Radio Broadcasting Station has separate antennas for day and night broadcasting. In contrast to the cophased antenna used during the day, the night broadcasting variety has only 2 tiers of half-wave elements.²⁶ It has been reported that in view of the great power radiated by these antennas, the horizontal conductors have been replaced by copper cylinders mounted on steel towers.²⁷

A rhombic antenna is constructed horizontally with the mast height at 30 m so that the principal axis of the rhombic antenna coincides with the required directivity. The terminating resistance is an important part in the operation of a rhombic antenna; upon it depends the unidirectivity of the antenna. One of the advantages of this type is that it can cover a frequency band extending from 15 to 40m. A disadvantage lies in the presence of absorption resistance which expends from 25 percent to 35 percent of the energy being transmitted to the antenna.²⁸

The V-type antenna designed by A. A. Pistol'kors differs from the common horizontal balanced element in that its arms form an angle of 90 degrees. This antenna belongs to the group of wideband low directional antennas. Each half of the antenna has a radiation pattern in a horizontal plane. The directivity of a V-antenna in a horizontal plane is very low. This is useful in many cases. By increasing the diameter of the element, the V-antenna can be used for wide range operations. Feeding this antenna is accomplished by a 4-wire feeder or by a 2-wire exponential line which at the same time matches the antenna with the basic feeder.²⁹

In short-wave communications the curtain type of array is used extensively. An example of this type known as the "travelling wave" antenna. This receiving antenna consists of one curtain used for night operations and two parallel curtains for day operations. The input impedance of the night antenna is equal to 400 ohms; this antenna is connected to a receiving 4-wire feeder with a characteristic impedance of 210 ohms via a 2-wire line, having an impedance of 450 ohms. The exponential feeder is designed for matching lines. The day antenna because of its 2 parallel curtains has an input impedance of 200 ohms.

It should be noted that under the direction of V. D. Kuznetsov a "travelling wave" type antenna was developed with inductive coupling. This antenna has an efficiency of 80-90 percent and has a directive gain similar to that found in a rhombic antenna. In addition, this type is smaller than a rhombic antenna, with low radiation side lobes.³¹

ULTRA-SHORT-WAVE ANTENNAS: (Meter, Decimeter, Centimeter and Millimeter Types)

Ultra-short wave antennas operate on 1 mm - 10 m wave lengths.³² This covers a very wide range of frequencies extending from VHF to UHF.³³

This category is divided into 2 groups; meter and decimeter wave antennas; and centimeter and millimeter wave antennas. The meter and decimeter wave antennas, known as the wide-band type, are primarily employed in television, in addition to radar and radio astronomy, whereas the centimeter and millimeter wave antennas are basically used in radar.³⁴ Besides, the meter and decimeter wave antennas are used in radio communications, FM radio broadcasting, radio relay communications, etc.³⁵

One of the interesting antennas is a Yagi type known as the "wave duct" antenna. This antenna consists of multi-elements, for example, a two element antenna has an active element and reflector, whereas a five element antenna has an active element, reflector and 3 directors.⁴⁰ The elements of a multi-element antenna are made of duralumin, brass or steel tubing with a diameter of 10-20 mm. The gains are as follows: two element-1.4, three element-1.8-1.9, five element-2.7.⁴¹

A multi-element antenna of the "wave duct" Yagi type, is widely used. The antenna consists of a frame with half-wave elements attached to it, with one of them an active element connected to the transmitter via a feeder line. It usually has 4 passive elements but sometimes has as many as 6 in radar installations. One of the elements serves as a reflector.⁴²

A two stack five element antenna of the "wave duct" type antenna consists of two 5 element antennas mounted on a common mast. The gain of such an antenna depends on the distance between stacks. With $H = \lambda/2$ the voltage gain is 3.5 and with $H = \lambda$ it increases another 20 percent.⁴³

A four stack five element "wave duct" antenna type, mounted on a common mast. The distance between stacks is $H = \lambda/2$. The gain factor of such an antenna is equal to 5-5.5. This antenna is fed by a coaxial cable having a characteristic impedance of 75 ohms, and arranged so that the active elements of all 4 stacks are co-phased with the cables, similar to the 2 stack five-element antenna.⁴⁴

Another similar directive antenna, also called a "wave duct" Yagi type, consists of 5 element; passive reflector and directors. The reflector is a little longer than a half-wave. It is spaced about 0.15-.2 wavelengths from element reducing the antenna radiation to a minimum in the direction from element to reflector.² The three other elements are spaced $1/4$ wavelengths from each other.⁴⁵

Very widely used is the multi-element rectangular "mattress" array.⁴⁶ This is a unidirectional array made in a shape of a metallic grid with half-wave dipoles. The elements are spaced in a series of tiers. This antenna is made of wired screen.⁴⁷ Depending on the polarization of elements, either vertical or horizontal directivity is achieved. By having a large number of elements arranged in a row, a sharper concentration of radiated energy is obtained in a given direction. The radiation from all the elements is cophased.⁴⁸

In designing antennas for operations in a relatively narrow band of frequencies, the reflector type is used. A good example of this type is the cophased antenna. The drawback of this type is that it has a great deal of anterior radiation. This type antenna is used primarily in the decimeter wave region.⁴⁹

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A complex cophased antenna system⁵⁰ consists of 7 cophased half-wave elements arranged in a horizontal row. This array is centered with currents having 180 degree phase difference.⁵¹

There are many sound reasons for the popularity of microwave antennas in the U.S.S.R. however, one of the foremost reasons is that their antenna radiation patterns are easily controlled, with beams that can be extremely directive, narrow or wide depending upon the circumstances.⁵²

The horn antenna is perhaps the most popular type used in microwaves. These antennas are divided into sectoral conical, pyramidal, biconical, exponential, etc.⁵³

The sectoral horn is flared out in the H-plane known as an H-plane sectoral horn,⁵⁴ whereas another horn may be flared out in the plane of the electric field E and is known as an E-plane horn.⁵⁵ The rectangular horn is flared out in both planes⁵⁶ and is known as a pyramidal horn, etc.⁵⁷

An interesting horn parabolic antenna is illustrated.⁵⁸ This high-gain antenna has a good matching arrangements with the feed system, with the energy levels low in all but the preferred direction.⁵⁹ This antenna has been specifically designed to operate with the "Vesna" radio relay equipment, developed by the NII (Scientific Research Institute) of the U.S.S.R. Ministry of Communications.⁶⁰

The above-mentioned horn antenna consists of 3 parts: a parabolic reflector, a basic pyramidal horn and a matching horn arrangement. The parabolic reflector and the frame is made of aluminum. In order to protect the antennas from strong winds, snow, etc., it is secured to steel girders. These antennas have a rotating mechanism and can rotate either in a horizontal or vertical plane.⁶¹ The aperture of the antenna can be hermetically sealed by a cover made of dielectric material and practically does not reflect any energy.⁶² This antenna has proven to be very satisfactory for radio relay lines; and is considered much simpler in construction and less expensive than the horn lens antenna types.⁶³ (For details see: "Vesna" Radio Relay System).

The next antenna is a long type pyramidal horn installed vertically and secured to the tower. For transmitting the greatest maximum

radiation in a horizontal direction, flat reflectors are installed on the top, forming a 45 degree angle with the horn. In mobile stations and also some permanent installations this type is not suitable, although it is being used as receiving and transmitting antennas by many radio relay lines.⁶⁴

The disadvantage of this type antenna is that although it is highly directive it has to utilize such a long horn that it is to some degree impractical. Therefore, the problem has been to decrease the length of the horn and yet retain its highly directive qualities.⁶⁵

Parabolic reflector antennas are widely used to modify the radiation pattern of a radiating element. These are high-gain antennas with a narrow and sharp beam.⁶⁶

There are 4 types of parabolic reflector antennas currently in use, consisting of the following: cylindrical parabolic reflector; paraboloidal reflector; truncated paraboloidal reflector; and the elliptical paraboloidal reflector.⁶⁷ The first type produces a beam which widens in the H-plane and narrows in the E-plane.⁶⁸ The second type is a rotating paraboloidal reflector which is used to obtain a point radiation pattern with a narrow beam both vertically and horizontally. The third and fourth types are used for fan-like and sectional radiation pattern.¹⁴²

Another antenna which is widely used is the lens antenna. It has been indicated by V.I.Beketov that in many instances lens antennas are preferred over the parabolic types since the tolerances for lens antennas are less rigid than parabolic types, making it easier to manufacture. Another advantage mentioned is that the exciters of lens antennas do not cause distortion in the aperture field of the antenna, since the feeding system is not located in the radiation field as it is in the majority of parabolic antennas.⁷⁰

The lens antennas are divided into delay lenses and accelerated lenses.⁷¹

At the present time delay lenses are being made primarily from artificial dielectrics because of the saving in weight.⁷² The dielectric lens can be made of discs, spheres, strips, and rods. It has been stated that this problem has been thoroughly investigated by Soviet scientists N. A. Kaptsov and M. A. Bonch-Bruyevich.⁷³

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Whereas the artificial dielectric lens is dependent upon retardation of the wave by the lens, the accelerated lens naturally depends upon the acceleration of the wave by the lens.⁷⁴

Dielectric type antennas are used as independent antennas, also as exciters replacing the horn type antenna. The weight of dielectric antennas is proportional to the cube of the operating wave, which makes it impractical to employ them on waves longer than 10-25 cm. On very short waves, dielectric rod antennas have many advantages such as, good directivity, compactness, light weight, and the fact that they can be used in a wide band of frequencies. The disadvantages are chiefly due to the complicated feeding system and the dielectric losses, which significantly lower the antenna efficiency.⁷⁵

With regard to slot antennas it can be simply stated that these antennas have a radiating element formed by a slot in a metal surface. According to Soviet sources, M. S. Neyman was one of the first to investigate the use of slot antennas by studying the radiation from small resonant slots. Further development of the theory of slot antennas was carried on by other Soviet scientist, such as A. A. Pistol'kors and Ya. N. Fel'd.⁷⁶

In 1944, A. A. Pistol'kors applied the principle of "duality" to the slot antenna in which he explained the physical phenomena involved in the operation of this type antenna.⁷⁷ Among other things, in this principle it was pointed out that there was a connection between the radiation conductance of the slot and the radiation resistance of the dipole associated with it.⁷⁸

In radar, paraboloids are widely used. A radar type parabolic antenna with a fan like pattern used for vertical is shown. In this antenna, power is fed into the reflecting surface through a waveguide which projects in front of the antenna.⁸⁰

NEW ANTENNAS AND RESEARCH

Five Band Antennas

It is noted that vertical antennas with a suppressed vertical component of the radiation pattern are advantageous for long range communication. An antenna is described, having a matching device which operates without switching in five ranges (10, 14, 20, and 80). The construction of the antenna is similar to that of the ground-plane type. The vertical part is made from duralumia pipes,

20 to 35 meters in length. The antenna was installed at the UB5UG radio station in July 1959. It operates without retuning owing to its wide-band properties on all bands mentioned above. The advantages of this antenna as compared to the ground plane type was especially pronounced in the 20 m and 14 m bands.⁸¹

Optimum Sharp Pattern Antenna

The Siberian Institute of Radio Physics and Electronics recently solved the problem of the distribution of antenna currents producing the optimum "Sharp" pattern of directionality. This problem was considered with linear antennas with equally removed emitters.

In practice, it was necessary to diminish the distance between emitters and to learn to direct the "ray" without moving the antenna itself. This problem was solved by American scientists, however, only for the case when the distance between emitters is not less than half the wavelength. In this simple use it was possible to alter the direction of the "ray" relaying the constant phase different through the neighboring emitters.

The laboratory succeeded in solving the problem of optimum antennas for the case when the distance between emitters is less than half the wavelength, as well as for the simple case. It was found that while the solution of the problem for coverages to the well known polynomials of Chebyshev, inclined from zero by at least one segment $(-1, 1)$ the solution of the problem of optimum antennas for distances requires the application of the polynomials of Akhiezer, inclined from zero by at least two segments.

In the case when it is impossible to obtain an optimum antenna, emitting at or given angle from the axis, from an antenna emitting at right angles to the axis, by relaying phase differences. The problem becomes rather complicated and mathematically reduced to a problem of Chebyshev type of the formulation of functions possessing certain experimental properties. Those functions were found. Their special cases are the polynomials of Akhiezer and Chebyshev. The results obtained allow technical calculations of optimally directional antennas to be made.⁸²

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Bibliography

Books

1. Ardab'yevskiy, A. I. et al., Posobive po raachetu Antenna Sverkhvysokikh Chastot (Handbook on the Design of Super High Frequency Antennas), Oborongiz, Moscow, 1957.
2. Ayzenberg, G. Z., Antenny ul'trakorotkikh Voln (Ultra Short-wave Frequency Antennas), Moscow, 1957.
3. Beketov, V. I., Antenny Sverkhvysokikh Chastot (Super High Frequency Antennas), Voenizdat, Moscow, 1957.
4. Belotserkovskiy, G. B., Antenny (Antennas), Oborongiz, Moscow, 1956.
5. Fradin, A. Z., Antenny Sverkhvysokikh Chastot (Super High Frequency Antennas). "Sovetskoye Radio", Moscow, 1957.
6. Kugushev, A. M., Sovremennaya Radioelektronika (Modern Radio Electronics), Gosenergoizdat, Moscow, 1958.
7. Kulikovskiy, A. A., Spravochnik Radiolyubitelya (Radio Amateur Handbook) Gosenergoizdat, Moscow, 1958.
8. Malloy, E., Radio Television Engineer's Reference Book, London, 1956.
9. Nelepets, V. S., Antenny metrovykh voln (Meter Wave Antennas) Moscow, 1957.
10. Shklovskiy, I. S., Radioastronomiya (Radio Astronomy), Moscow, 1955.
11. Ul'yanov, B. I., Antenny (Antennas), Sudpromgiz, Leningrad, 1957.

Periodicals

Vestnik Svyazi (Communication Herald), 1956, 1958.

Encyclopedia

Bol'shaya Sovetskaya Entsiklopediya, (Great Soviet Encyclopedia), Vol. 2, 1950.

List Of References

1. Signal, January 1958, p. 12-14
2. Vestnik Svyazi, No. 8, 1956, pp. 8-10. Hereafter cited as V. S.
3. G. S. Ayzenberg, Antenny ul'trakorotikikh voln, Moscow, 1957, p. 2.
4. B. I. Ul'yanov, pp. 38-39, Antenny (Antennas)
5. G. B. Belotserkovskiy, Antenny, Oborongiz, Moscow, 1956, p. 237
6. Ibid., pp. 236-239; cf. Ul'yanov, p. 39.
7. A. Z. Fradin, p. 3; cf V. S., No. 11, 1959, p. 4.
8. A. I. Ardab'yevskiy, et al, Posobiye po raschatu Antenny Sverkhvysokikh Chastot, Oborongiz, Moscow, 1957, p. 4.
9. Ibid., p. 125.
10. Belotserkovskiy, G. B., Antenny (Antennas), Oborongiz, Moscow, 1956.
11. Ul'yanov, p. 125.
12. Ibid., pp. 125-126.
13. Ibid., pp. 40-41.
14. Belotserkovskiy, p. 294.
15. Ibid.
16. Ibid., Ul'yanov, 125-126.
17. Ul'yanov, pp. 126-127
18. B. S. E. No. 2, 1950.
19. Belotserkovskiy, p. 297.
20. Ibid.
21. Ul'yanov, p. 129.
22. Beketov, p. 26.
23. V. I. Beketov, Antenny Sverkhvysokikh Chastot, Voenizdat, Moscow, 1957, p. 26.
24. Ibid.

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25. Ibid.
26. Ibid, pp. 312-313.
27. BSE, No. 2, 1950, p. 492.
28. Ibid.
29. BSE, No. 2, 1950, p. 303.
30. Beletserkovskiy, p. 327.
31. Ibid, p. 328.
32. Ul'yanov, p. 134.
33. E. Malloy, Radio Television Engineer's Reference Book, London, 1956, sec. 45-11.
34. Ul'yanov, p. 41.
35. Ibid., p. 135.
36. Ibid, p. 136.
37. Ibid., p. 138.
38. Ibid.
39. BSE, No. 2, 1950, p. 493.
40. Kulikovskiy, p. 257.
41. Ibid, pp. 256-259.
42. V. S. Nelepets, Antenny metrovykh voln, 1957, p. 56.
43. Kulikovskiy, p. 259.
44. Ibid., p. 262.
45. Beketov, p. 36.
46. Nelepets, p. 47.
47. Ibid., p. 47.
48. Ibid., p. 47.
49. Beketov, p. 32.
50. V. S. Nelepets, p. 50.
51. Ibid., pp. 50-51
52. Ayzenberg, p. 2, p. 410.

53. Beketov, p. 40, 49.
54. Ibid., p. 40.
55. Ibid., p. 42.
56. Ibid., p. 46.
57. Ibid., p. 46.
58. V. S., No. 11, 1958, p. 4.
59. Ibid.
60. Ibid.
61. Ibid., p. 4.
62. Ibid., p. 5.
63. Ibid., p. 6.
64. Fradin, p. 252.
65. Ibid., pp. 252-253.
66. Beketov, p. 56.
67. Beketov, p. 58.
68. Ibid., p. 59.
69. Ibid., pp. 58-59.
70. Ibid., p. 86.
71. Ibid., pp. 58-59.
72. Fradin, p. 24.
73. Beketov, p. 75.
74. Ibid., p. 77.
75. Beketov, p. 91.
76. Ibid., p. 92.
77. Fradin, p. 442-443.
78. Ibid.
79. Beketov, p. 65.
80. Ibid., p. 63.

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- 81. Medinets, Yu., Radio, No. 2, September 1960, p. 44.**
- 82. Vestnik Akademi Nauk U.S.S.R. No. 10, 1957, p. 108.**

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SOVIET RADIO OPERATIONS MONITORING SYSTEM

All radio communication and broadcast facilities in the Soviet Union are subject to the supervision and control of a centrally organized monitoring system. Under the U.S.S.R. Ministry of Communications, the radio engineering and monitoring system of the Soviet Union is run by the Office of State Inspections for Electrical Communications.

The monitoring system holds a vital place in U.S.S.R. strategic telecommunications. This is largely attributable to several special features of the telecommunications network which combine to enhance the importance of radio communications. The significance of radio, in turn, points up the salient role of the Soviet listening system, which patrols the spectrum for technical violations throughout the Soviet Union.

On the basis of present information, there are no indications that military radio operations are outside the scope of the Soviet monitoring systems nor that aviation, marine, industrial, amateur and other special radio networks are not within its purview. Moreover, the fact that these radio facilities and networks, including the radio amateurs, are generally available for military and other special purposes such as tracking satellites and space vehicles, increases their importance and the significance of monitoring.

Indications are that the effective powers exercised by the Soviet centralized monitoring function are slated to grow. It is apparently destined to be not only the supervisory but also the controlling agency for the entire radio communications system of the U.S.S.R. Radio facilities of all services and ministries in the country are to be within its purview. A network of large, specialized monitoring stations is to be built to this end. It is significant that although certain sectors within the Soviet state are tending toward decentralization, surveillance over that strategic instrument of power, radio communications, is to become more centralized and strengthened.

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However, there is evidence that the Soviet monitoring function suffers certain shortcomings which currently curtail its operations and effectiveness. Most prominent among these shortcomings appears to be the lack of appropriate, modern monitoring instruments and facilities, as well as their proper distribution. In addition, presently available monitoring equipment is not fully utilized, partly because of lack of suitably trained personnel. Soviet plans for the future, embracing an expanded network of specialized radio monitoring facilities, are presumedly designed to deal with these defects. Such measures must also reflect the continuing growth in importance, extent and complexity of the Soviet radio communications system.

ORGANIZATIONAL STRUCTURE

Administration

The radio engineering and monitoring system of the Soviet Union is designed to embrace all radio communications and broadcast facilities in the country, both main and intradepartmental.¹

Over-all control of monitoring facilities and operations is vested in the Office of State Inspections for Electrical Communications (Gosudarstvennaya inspektsiya elektrosvyazi), under the U. S. S. R. Ministry of Communications.²

The Office of State Inspections exercises its functions through radio engineering and monitoring stations (punktov tekhnicheskogo radiokontrolya) and other appropriate facilities. These radio monitoring stations reportedly are located throughout the Soviet Union in such a way as to provide for the monitoring of all radio communications and broadcast facilities in the country.³

Function and Responsibility

The stated function and responsibility of the radio engineering and monitoring system as operated in the Soviet Union is to locate possible discrepancies in the over-all operation of radio equipment, facilities and channels; to eliminate discrepancies when they occur; to determine the cause of discrepancies in the radio equipment or channels; to take operational measures to correct quickly the discrepancies detected; and to prevent interruptions in communications.⁴

Organization of Monitoring Operations

Soviet radio engineering and monitoring operations may be divided into four types, as follows:⁵

1. Local operations monitoring (Mestnyy ekspluatatsionnyy kontrol'), performed by local operating personnel at radio stations, line equipment rooms and other radio channel links.
2. General operations monitoring (Obshchiy operativnyy kontrol') which is comprehensive monitoring performed by special personnel organized into monitoring units at large radio centers.
3. Zonal inspection and monitoring (Zonal'nyy inspektsionny kontrol'), accomplished through a special network of radio engineering and monitoring stations.
4. Centralized Radio Engineering and Monitoring (Tscentralizovenny radiokontrol'), performed by the Central Radio Monitoring Station.

Local, subordinate, monitoring activities would be done under the jurisdiction of the operators and supervisors of a particular radio operating facility.^{6, 7}

The subordination of the general operations monitoring units is not clear. Such units may be under the jurisdiction of the Directorate of Radio Communications and Broadcasting (Direktsiya radiosvyazi i radioveshcheniya) whose facilities they monitor, or such units may actually belong to the monitoring system and be under the jurisdiction of the Office of State Inspections for Electrical Communications.⁸

Zonal inspections and monitoring stations are under the jurisdiction of the Office of State Inspections for Electrical Communications.⁹

Centralized monitoring is represented by the Central Radio Monitoring Station. This facility is under the U. S. S. R. Ministry of Communications and operates through the Office of State Inspections for Electrical Communications.¹⁰

OPERATIONAL STRUCTURE

Mission

Operationally, development of the centralized radio monitoring organization is planned so that it will be not only the supervisory but also the controlling agency for the entire radio communications system.¹¹

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An authoritative Soviet source states that the specific "primary mission" of the centralized radio engineering and monitoring system in the Soviet Union is:¹²

- supervision over the operation of radio stations to see that they maintain authorized frequencies;
- supervision for the purpose of determining conformance with radio operating regulations;
- supervision over radio wave propagation conditions;
- discovery of free, unutilized frequencies;
- supervision over the quality of communication transmissions;
- supervision over compliance with the recommendations of the International Telecommunications Union, of which the Soviet Union is a member;
- development and implementation of operational-engineering measures which will improve the radio communication system.

No indication is given of what activities, if any, are in addition to the stated primary mission of the U. S. S. R. radio monitoring system. It is known that the Office of State Inspections licenses and inspects maritime and shipboard radio facilities.^{11a} At present, however, information is available only on the exercise of the monitoring function over the radio amateur network of the Soviet Union.

All radio amateur stations in the Soviet Union, whether individually or collectively operated, are subordinate to the Central Committee of DOSAAF (DOSAAF—Vsesoyuznoye dobrovol'noye obshchestvo sodaystviya armii, aviatsii i flotu—All-Union Voluntary Society for the Promotion of the Army, Aviation and Navy).¹³

For permission to open and operate their facilities, however, radio amateurs must apply to the local Office of State Inspections, which grants station licenses. Licenses, which are issued only for a specific station, location and power, must be renewed each year. State Inspections must be notified if an amateur station ceases operations for more than three months, or completely closes down. In the latter case, the transmitter must be dismantled or turned over to a DOSAAF club.¹⁴

Operation of radio amateur stations is strictly regulated and monitored by the Office of State Inspections. Such stations, may, for example,

communicate only with other amateur stations, except in cases of emergency. The local Office of State Inspections must immediately be notified of any emergency communication with a ship or plane in distress.¹⁵ Agencies of the Ministry of Communications may utilize radio amateur stations for transmitting messages in emergencies, with the permission of the Office of State Inspections.¹⁶

Radio amateurs may communicate only about technical matters pertaining to amateur operations and equipment. Amateur operators are strictly forbidden to transmit coded messages by radio, to use profanity, to operate on frequencies outside the amateur bands, or at a power higher than that approved. Furthermore, they must not use radio-telephone unless specifically licensed to do so.¹⁷ If a radio amateur violates such regulations, he may be warned, forbidden to operate on certain frequencies, fined or, finally, have his license revoked.¹⁸

Centralized Radio Monitoring

The scope of the centralized radio monitoring function in the Soviet Union is designed to be absolute. According to an authoritative source, "Centralized radio monitoring must embrace all radio communication networks of all departments which use radio facilities."¹⁹

Under the soviet system, the centralized monitoring function is exercised through the Office of State Inspections for Electrical Communications. The latter carries out this function with the aid of "radio engineering and monitoring stations located throughout the territory of the U.S.S.R. in such a way as to provide for monitoring the operations of all radio communications and broadcasting enterprises."²⁰

How are monitoring facilities established and operated under the centralized monitoring function?

Small monitoring stations with a limited amount of work may be established in the radio receiving station of a radio center.²¹

Large monitoring stations, however, are to be established as separate facilities. A Soviet radio communications authority states this emphatically: "Large radio monitoring stations positively must be constructed as separate, specialized installations, devoted solely to radio monitoring."²²

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Furthermore, this authority continues, such independent and specialized monitoring stations are to be equipped with the requisite number of receiving antennas, radio receiving facilities and a large number of monitoring and measuring instruments for indicating and recording the results of observations.²³ A considerable part of the monitoring function may be automatized in order to improve operations and cut costs.²⁴

These large, specialized monitoring stations undoubtedly constitute, and will carry out the functions of zonal inspectional and monitoring stations, discussed below.²⁵

The main or headquarters control center for centralized monitoring in the Soviet Union is the Central Radio Monitoring Station; it operates under the Office of State Inspections for Electrical Communications,²⁶ and is located in Moscow.

Mention of the existence of the Center for Radio Engineering and Monitoring has been noted in Soviet sources as early as 1946,²⁹ and several times since 1955;^{29a} however, very little information has been revealed relating to its operations.

In 1956, an engineer of the Moscow Directorate of Radio Communications and Broadcasting reported that the Center at that time conducted only frequency measurements, apparently because it lacked other appropriate monitoring equipment.³¹ About a year later, the Main Radio Administration of the U. S. S. R. Ministry of Communications acknowledged that "it was proper to raise the question about equipping the Center and the other monitoring stations with new monitoring and measuring apparatus. . . ." ³²

Zonal Inspection and Monitoring

Zonal inspection and monitoring is accomplished through a network of special radio engineering and monitoring stations (set spetsialnykh techaicheskogo radiokontrolye—FTRK).³³ The function of zonal inspection and monitoring is to promote the "efficient and proper operation of the entire communications system."³⁴ To perform this function it must be able to detect and eliminate discrepancies which arise at various points in the radio communications system throughout the U. S. S. R.³⁵ As this function involves the monitoring of many radio lines extending over a tremendous area, monitoring operations must be conducted under a centralized or zonal system, i. e., be organized within particular areas or boundaries.³⁶

The zonal stations which carry out this mission, it is apparent, are the principal components of the centralized monitoring system of which the Central Radio Monitoring Station is the main or headquarters station.³⁷ Strategic radio communications within a given zonal area, in accordance with this set-up, are subject to monitoring, and, probably, control by the zonal monitoring station for that zone.³⁸

Although no report on the activity of a specific or identified zonal monitoring station has been found, a 1956 report sheds some light on the operation of such radio monitoring facilities in the Soviet Far East. The chief of the Khabarovsk radio station, A. M. Kisal'nikov, has reported that: "... radio monitoring stations are actually occupied with one narrow function.* It is difficult to compel them to monitor any particular radio channel. This can be done only with the help of higher authority. At the same time, part of the monitoring and measuring equipment at monitoring stations is idle." ³⁹

Kisal'nikov further reported that many large "peripheral" radio centers did not have any monitoring activity simply because they did not have modern monitoring equipment. ⁴⁰

General Operations Monitoring

To carry out the functions of general operational monitoring, special radio engineering and monitoring units are established at large radio centers.⁴⁰ These units are responsible for checking the operation of all facilities at a given radio center and for monitoring the over-all operation of radio communication lines.⁴¹

At small and medium size radio centers these units are organized or integrated into monitoring-dispatcher units. ⁴²

Not only are such radio engineering and monitoring units responsible from the technical or engineering standpoint for the quality of operation of the radio facilities; they also monitor the conduct and performance of radio operations by the local operating staff. ⁴³

These functions, performed by the special radio engineering and monitoring units which are established at large radio centers, are reportedly exercised "on behalf of the directorate of radio communications and broadcasting under whose jurisdiction the radio center operates." ⁴⁴

* Frequency measurement seems to be implied.

Local Operations Monitoring

The function of local operations monitoring is "to assure the operation of pertinent equipment on a given section of radio communication line." It must maintain operations within established norms and be able to carry out proper corrective measures. The most "essential requirement for local operations monitoring is simple inspection and servicing procedures in order to locate and eliminate any faults in communications operations."⁴⁵

This type of monitoring, carried out by the operating radio facility itself in the course of regular operations, is done by means of meter readings and checks; it is supplemented by routine preventive maintenance, which includes checking and testing of components.⁴⁶

List of References

1. Iodko, Ye. K. Organizatsiya i planirovaniye radiosvyazi i radioveshcheniye (The Organization and Planning of Radio Communications and Broadcasting), gvyaz'izdat, Moscow, 1958, 543 p., p. 373.
2. Iodko, op. cit., p. 373.
3. Iodko, op. cit., p. 373.
4. Iodko, op. cit., p. 372.
5. Adamskiy, V. E., Radiopriyammye tsentry (Radio Receiving Centers), Svyaz'izdat, Moscow, 1949, 455 p., p. 355; Iodko, op. cit., p. 372; Vestnik Svyazi, No. 5, 1956, p. 16. Hereafter cited as V.S.
6. Iodko, op. cit., p. 372-373.
7. Ibid.
8. Ibid.
9. Ibid.
10. Ibid.
11. Iodko, op. cit., p. 374 11a. Sinitain, M. T. Ekspluatatsiya radiosvyazi na Morskoi Flota (Radio Communications in the Maritime Fleet), Moskva, 1955 p. 295, p. 263.
12. Iodko, op. cit., p. 373-374.
13. Radio, No. 4, 1957, Prilozheniye dlya Machinayushchikh (Supplement For Beginners), p. 2.

14. Ibid., p. 2-3.
15. Ibid., p. 3.
16. Ibid.
17. Ibid.
18. Ibid.
19. Iodko, op. cit., p. 373.
20. Iodko, op. cit., p. 373.
21. Bol'shaya Sovetskaya Entsiklopediya (Great Soviet Encyclopedia), 2nd ed., 1955, v. 34, p. 498; Iodko, op. cit., p. 373.
22. Iodko, op. cit., p. 373.
23. Iodko, op. cit., p. 373.
24. Iodko, op. cit., p. 373.
25. Iodko, op. cit., p. 373.
26. U.S.S.R. Ministerstvo svyazi. Inzherno-tekhnicheskiy spravochnik po elektrosvyazi. t. VII: Radiosvyaz' (Ministry of Communications of the U.S.S.R. Engineering Handbook for Electrical Communications. v. VII: Radio Communications), Moscow, 1958, 500 p., p. 138. Hereafter cited as Radiosvyazi; Adamskiy, op. cit., p. 355.
27. Moskovskaya gorodskaya spravочно-informatsionnaya kontora. Moskva: kratkaya adrenno-spravochnaya kniga. Po sostoyaniyu na 1 Sentyabraya 1958 g. (Moscow City Information Office. Moscow: Concise Address and Information Handbook. Effective 1 September 1958), 1958, 463 p., p. 19.
28. V.S., No. 1, 1958, p. 1.
29. V.S., Nos. 4-5, 1946, p. 9.
- 29a. Radiosvyazi, p. 138; V.S., No. 5, 1956, p. 16; V.S., No. 1, 1957, p. 30.
30. V.S., No. 8, 1948, p. 8.
31. V.S., No. 5, 1956, p. 16.
32. V.S., No. 1, 1957, p. 30.
33. Iodko, op. cit., p. 372.
34. Iodko, op. cit., p. 373.

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35. Iodko, op. cit., p. 373.
36. Iodko, op. cit., p. 373.
37. Iodko, op. cit., p. 373.
38. Iodko, op. cit., p. 372, 373; Adamskiy, op. cit., 355.
39. V. S., No. 1, 1956, p. 31.
40. Iodko, op. cit., p. 373.
41. Ibid.
42. Ibid.
43. Iodko, op. cit., p. 372-373.
44. Iodko, op. cit., p. 373; Adamskiy, op. cit., p. 355.
45. Iodko, op. cit., p. 372-373.
46. Iodko, op. cit., p. 343, 373; Radiosvyazi, p. 198-223.

SECTION 5

U. S. S. R. SATELLITE AND SPACE VEHICLE TRACKING SYSTEMS

The Soviet Union, as revealed by latest Soviet sources, appears to have significant capability in the satellite and space vehicle tracking field. This fact is evinced by data released in conjunction with the tracking of the Soviet moonshot, now allegedly orbiting the sun. Soviet facilities reportedly tracked the rocket's signals, through cislunar into translunar space, for a distance of some 597,000 kilometers. During this flight, U. S. S. R. ground tracking stations reportedly maintained reliable radio communications with the rocket and received trajectory and measurement data from the vehicle's telemetering apparatus.

A great complex of measuring facilities located throughout U. S. S. R. territory was used to track the flight of the space rocket. These included automatic radar facilities, telemetering stations, a radio guidance system to control the trajectory of the rocket, low-frequency radio receiving stations, and optical means for observing and tracking the artificial comet.

With the moonshot, as with the sputniks, wide use apparently was made of the Soviet Union's extensive network of radio amateurs; reportedly some 10,000 of them conduct space tracking.

THE DEVELOPMENT OF SPUTNIK TRACKING AND OBSERVATION

One method of approaching the development of the Soviet space vehicle tracking system is through information revealed in connection with the launching of the first three sputniks. Such information, when correlated with other pertinent data, may provide further bases for evaluating Soviet space tracking capabilities. This is the method which will be followed for this report.

This section will present information available on the development, organization and extent of U. S. S. R. satellite and space vehicle tracking

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systems. In this report, radio and radar tracking systems are emphasized; information relating to optical or other systems is included only when it reveals pertinent data.

A brief characterization of the Soviet concept of tracking and observation is contained in a Pravda report which followed the launching of Sputnik I:

"The most important aspect of the investigation conducted by means of the artificial earth satellite is the observation of its movement, the processing of the observations, and the forecasting, as a result of the processing, of the satellite's further movement. Observation of the satellite is done by radiotechnical means and also in observatories by means of optical instruments. In addition to specialists with their facilities, radio amateurs are widely attracted to make observations as well as groups of amateur astronomers conducting observations on astronomical posts by means of optical instruments specially manufactured for this purpose."¹

The same report further specifies that the "scientific stations" conduct their observation by means of radar and radio direction finders. Observation of a satellite's movement by photography is also used. After the power supply aboard a satellite is exhausted and the transmitters stop functioning, observation of the satellite is conducted solely by optical methods and radar.²

Sputnik I

Soviet sources show that particular attention was paid to obtaining data from Sputnik I about conditions affecting radio communications, so that this information could be used in designing radio equipment for future satellites.³ Factors affecting the passage of radio waves through the atmosphere, for example were especially sought.⁴ To get as extensive information as possible on this subject, special radio receivers were designed for use by radio amateurs to track the satellite.⁵ To improve tracking techniques, amateurs were given special instructions on satellite observation and the recording of satellite signals.⁶

Sputnik II

Special radio apparatus was on board to provide for the transmission of data to earth tracking stations.⁷ This equipment consisted of an improved multi-channel radiotelemetering transmitter using a time division system.⁸

Information was transmitted in the form of coded signals broadcast on two different frequencies, 20.005 megacycles and 40.002 megacycles. ⁹

The frequencies used and the ample transmitter power provided enabled the largest number of radio amateurs to track the satellite along with the stations especially assigned to this work. ¹⁰

Sputnik III

This third Soviet satellite was characterized in the press as a "veritable space laboratory", with a wide variety of electronic measuring apparatus. ¹¹

It is apparent that a considerable ground tracking and computational capability was implied by the nature of the instrumentation Sputnik III carried into orbit and the range of measurements undertaken. In confirmation, Pravda reported that both the radio and optical facilities and methods for satellite tracking had been "considerably improved" since the launching of the second satellite. ¹²

Before describing these tracking facilities, a brief description of the radio link—the on-board radio equipment of the satellite—is in order.

Sputnik III reportedly carried "several" radio transmitters for tracking purposes. One of these was a high power transmitter operating on the frequency of 20.005 megacycles. It was designed to provide for the reception of the satellite's radio signals by ordinary amateur radio receivers. ¹³

The high-resolution, multichannel radiotelemetry system of the satellite had a high volume capacity. The telemetry system included a number of devices for data storage, which recorded the instrument measurements. As the satellite passed over "special tracking stations" located within U. S. S. R. borders, this stored data was rapidly transmitted from the sputnik. ¹⁴

Reportedly, several specially created "scientific tracking stations", equipped with a "large amount of electronic equipment", were employed in connection with the third satellite. ¹⁵ In addition, the network of ground optical tracking stations had been expanded and improved. Several points located abroad were also included in this network. ¹⁶

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Lunik

Just prior to the launching of the moonshot, A. N. Nesmeyanov, President of the U. S. S. R. Academy of Sciences, reported that the tracking stations of the U. S. S. R. were continuously being improved. At that time, he stated, they comprised an integrated system of automatically functioning facilities that gather, record and analyze very precise and predictive data pertaining to satellites.¹⁷

Subsequently, more information has been revealed on the nature and extent of the tracking system of the U. S. S. R. Certain pertinent information was disclosed in the distance-time and history log of Lunik's flight. Recent reports from Moscow add considerable detail about the present tracking system in the Soviet Union, particularly as this system was utilized to track the moonshot.

On the basis of available information, a preliminary collation of these data is presented below.

According to a Soviet radio report:

"The use of powerful ground transmitters and highly sensitive receiving installations insured reliable measurements of the rocket's trajectory up to the distance of some 500,000 kilometers."¹⁸

The flight of the Soviet space rocket, this source further states, was tracked by a huge complex of measuring facilities located throughout the Soviet Union.¹⁹ These facilities were utilized to determine the trajectory and to receive data telemetered to earth from instruments and radio equipment on board the rocket.²⁰

Included among this huge complex of measuring facilities were the following:²¹

1. A group of automatic radar tracking installations was used for the precise determination of the initial trajectory of the rocket. These included a chain of radar stations with giant antennas designed for satellite tracking, which girds the Soviet Union, according to a recent article by Academician Nesmeyanov.²²
2. A group of radiotelemetering stations was used to record scientific data transmitted from the rocket. The ground radio telemetering stations received the scientific data relayed by the telemetering system on board the rocket, and recorded it

on film and magnetic tape.²³ To insure the reception of the signals from the rocket, highly sensitive receivers and special antennas with a large effective antenna surface were utilized. Simultaneously, field intensity was measured and a number of other measurements related to ionospheric research were made.²⁴ The data on cosmic rays was transmitted by varying the modulation of the carrier frequency of the transmitter, operating on two frequencies, 19.997 and 19.995 megacycles. The main scientific data was transmitted on the 19.993 megacycle frequency by varying the length of the intervals between signals.²⁵

3. A radio system was used for controlling the rocket's trajectory at great distances from the earth. There is indication that the initial trajectory of the rocket was radio controlled. Moscow radio reported as follows:

"The control of the trajectory of the space rocket up to a distance of 400,000-500,000 kilometers and the measurement of its trajectory were carried out by means of a special radio system working on the frequency of 183.6 megacycles. The data on the measurements were automatically received at precisely determined times and were recorded in digital codes by special instruments. These data, together with the time they were made by the radio system, were transmitted to the coordinating and computing center. The simultaneous analysis of the aforesaid measurement, along with data obtained by the radar system, made it possible to establish with greater precision the elements of the rocket's trajectory and to directly control the movement of the rocket in space."²⁶

4. Radio stations were employed to receive signals beamed by the rocket's transmitters on frequencies of 19.997, 19.995 and 19.993 megacycles. Professor Boris V. Kukarkin, Vice President of the International Astronomical Union and chairman of the Astronomical Council, U. S. S. R. Academy of Sciences, is reported as saying that the Soviet cosmic missile could be described as a "guided rocket". He did not elaborate.²⁷

The frequency of 183.6 megacycles is the highest of the four reportedly used on Lunik.²⁸ Signals on this frequency (which is in the range of those used in television) would be reflected back into space after hitting the earth. For this reason, the transmitter must be in line of sight with the receiver to be received.

RADIO TRACKING STATIONS

The radio tracking stations, working on the frequencies of 19.993, 19.995 and 19.997 megacycles, received signals from the rocket and recorded them on magnetic tapes. The main mass of the tremendous amount of scientific data obtained by the rocket's instruments and relayed to telemetering stations on earth was handled on these frequencies.²⁹

RADIO AMATEUR TRACKING FACILITIES

Additional information on the organization of Soviet radio amateurs for satellite tracking was revealed in August 1958, at the Moscow meeting of the Special Committee for the International Geophysical Year.³⁰ According to this report, radio amateur tracking stations in the Soviet Union are organized in 28 radio clubs. Most of the clubs are in large cities situated mainly along the 55th parallel and along the southern boundaries of the Soviet Union. The selection of these points was made for the purpose of conducting regular reception of signals at all times during the passage of a satellite over the Soviet Union. These 28 points (see list below) are equipped with receiving, measuring, and recording equipment; radio amateurs carry out a round-the-clock watch at these points.³¹

About 10,000 Soviet radio amateurs, located in 300 populated points, took part in the tracking of the first and second Soviet satellites.

Some Cities in Which Radio Amateur Clubs Track Satellite Signals

- | | | |
|-----------------|-----------------|-----------------------------------|
| 1. Moscow | 11. Baku | 21. Chita |
| 2. Leningrad | 12. Kazan' | 22. Blagoveshchensk |
| 3. Arkhangel'sk | 13. Sverdlovsk | 23. Khabarovsk |
| 4. Kaliningrad | 14. Ashkhabad | 24. Vladivostok |
| 5. Vil'nyus | 15. Tashkent | 25. Aleksandrovsk
Sakhalinskiy |
| 6. L'vov | 16. Alma-Ata | 26. Yakutsk |
| 7. Kiev | 17. Omsk | 27. Magadan |
| 8. Simferopol' | 18. Novosibirsk | 28. Petropavlovsk-
Kamchatskiy |
| 9. Armavir | 19. Krasnoyarsk | |
| 10. Odessa | 20. Irkutsk | |

List of References

1. Pravda, 9 Oct 1957, p. 2.
2. V. Petrov, Iskustvennyy sputnik zemli (The Artificial Earth Satellite), Voennoye izdatel'stvo Ministerstva Oborony Soyuza SSR (Military Publishing House of the U. S. S. R.), Moscow, 1958, 305 p., p. 279; op. Kaplan, op. cit., p. 58.
3. Radio, No. 6, 1957, p. 14-19; Vestnik Akademii Nauk, vol. 25, No. 9, 1955, p. 26; Pravda, 9 Oct 1957, p. 1.
4. Radio, No. 6, 1957, p. 16-17.
5. Pravda, 9 Oct 1957, p. 2.
6. Radio, No. 6, 1957, p. 17-19.
7. Radio, No. 12, 1957, p. 27.
8. Petrov, op. cit., p. 159.
9. Radio, No. 12, 1957, p. 26.
10. Radio, No. 12, 1957, p. 26.
11. Ibid.
12. Pravda, 18 May 1958, p. 3.
13. Ibid.
14. Ibid.
15. Ibid.
16. Ibid.
17. U. S. S. R., No. 1, 1959, p. 25.
18. Pravda, 12 Jan 1959, p. 3; FBIS, 13 Jan 1959, BB-16.
19. Pravda, 12 Jan 1959, p. 3; FBIS, 13 Jan 1959, BB-16.
20. Ibid.
21. Ibid.
22. U. S. S. R., No. 1, 1959, p. 26.
23. Pravda, 12 Jan 1959, p. 3.
24. Ibid.
25. Ibid.

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26. Ibid, FBIS, 13 Jan 1959, BB-15.
27. New York Times, 7 Jan 1959.
28. Pravda, 3 Jan 1959, p. 1.
29. Izvestiya, 6 Jan 1959, p. 1; Pravda, 12 Jan 1959, p. 3.
30. A. M. Shakhovskoy, "U. S. S. R. Amateur Radio Observations of Signals from the Soviet Artificial Satellite", in Selected Reports Presented by the U. S. S. R. at the Fifth Meeting of the Special Committee for the International Geophysical Year (CSAGI), Washington, D. C., 1958. This report was delivered at the meeting held in Moscow in August, 1958.
31. Shakhovskoy, op. cit.

SECTION 6

**MICROWAVE RADIO RELAY LINES—
OPERATING, UNDER CONSTRUCTION OR PLANNED**

According to statements made at the XXI Congress of the KPSS the total length of radio relay lines is to be increased six times by the end of the seven year plan. Furthermore, it was revealed that the radio relay trunk lines will eventually be linked to the cable lines forming a complete network of telephone-telegraph lines and including television and radio broadcasting. In addition, it is planned to have all the radio relay repeater stations operating unattended by remote control.¹

Actually the seven year plan calls for the development of multi-channel radio relay trunk lines transmitting television and radio broadcasting to all the capitals of the republics and other large centers. In addition the goal of this plan also consists of improving communications among the newly created economic administrative regions (Sovnarkhozes).²

It has been established that with the operation of new radio relay lines the number of intercity telephone channels will increase tremendously on many of the most important telephone lines.

At the present there are three different types of radio relay systems in operation. Of these, the most widely used is the line-of-sight system with repeater stations spaced from 50-60 km apart. The second type is the tropospheric scatter system with repeater stations usually spaced from 200-300 km, equipped with more powerful apparatus and larger antennas. The third type is the ionospheric scatter system with stations spaced at distances of 1000 miles or more.³

A future possibility, currently being discussed in the Soviet Union, is the use of earth satellites as relays for long distance communications.⁴

Also very important are microwave radio relay lines being installed on many Soviet railroads.

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To decrease the expenditures in constructing them it has been found useful to make maximum use of the topography, to reduce the number or repeater stations as well as tower heights.⁵

It has been reported that a frequency range of 1600-2000 mcs is being used on railroad radio relay lines. The average distance between stations in these lines has been estimated at about 41 km.⁶

In considering the problem of locating repeater stations on railroad lines, it has been decided that the sites should be as close to railroad stations as possible, with a maximum distance of 10-12 km between repeater stations and the railroad lines.⁷

Perhaps no less important in radio relay line construction is the metal consumption used per km. It has been estimated that on the average about one ton of metal is consumed per km of line.⁸

It is interesting to note that radio relay lines for railroads do not usually require a great number of channels. Therefore metric, rather than decimetric waves may be used, obviating the necessity for direct line-of-sight transmission. This makes possible the extension of distances between relay stations to as far as 150 km and regularly established communication centers may be utilized, reducing construction costs.⁹

Still another factor in building radio relay lines is the cost of antenna installations which account up to 15 percent of the total cost of construction.¹⁰

The following railroad radio relay lines are either planned, constructed or operating: Rostov-Shakhtnaya; Moscow-Kaluga; Novosibirsk-Belovo; Riga-Daugavpils; Moscow-Liski; Moscow-Kazan'; Sverdlovsk-Chalyabinsk; Moscow-Kiev; Leningrad-Moscow.¹¹

Special attention should also be given to the recent information concerning the creation of specialized microwave radio relay companies in the Soviet Army, having mobile transmitting-receiving equipment, including directional antennas, etc. It has been reported that these companies are constantly being trained in microwave type communications under field conditions.¹²

The date of the equipment and description of radio relay lines is given in respective sections of this report.

List of References

1. V. S. No. 2, 1959, ATS No. 5, 1959, p. 2.
2. V. S. No. 12, 1958, p. 2.
3. V. S. No. 3, 1959, p. 5-7.
4. Ibid.
5. ATS No. 11, 1958, pp. 18-20.
6. Ibid.
7. Ibid.
8. Ibid.
9. Ibid.
10. Ibid.
11. Ibid.
12. Voyenny Svyazist, No. 2, 1958, of Ibid., Hq. 5, 1958, p. 25.

SECTION 7

THE COMMUNICATION LINE TECHNICAL CENTER (LTU)

The LTU (lineyo-tekhnicheskii uzel—line technical center) is one of the most important cogs in the overhead telephone-telegraph system and, recently, also in the radio-relay system. It is also one of the largest organizations within the U.S.S.R. Ministry of Communications, with LTUs located in all the principal relay points throughout the Soviet Union. Although many specialized communication workers are regularly assigned to duties with LTUs, many others are called upon from nearby kolkhozes, etc., for assistance in emergencies.

In the December 1954 reorganization of the U.S.S.R. Ministry of Communications, the smaller LTUs were incorporated into enlarged LTUs. This was done in order to expedite maintenance and repair work and to increase efficiency. Although many LTUs are located near small cities, they are most frequently located at important points on the overhead communication lines.

Foremost among the problems of maintenance of overhead lines has been the constant need for replacing wooden poles and supports, because of their rapid deterioration. In addition, the absence or depletion of timber in many regions has made the pole replacement problem increasingly more difficult. In the last few years a network of shops have been created in the LYUs, SMURs (Construction-Assembly Administration for Radiofication), etc., to produce reinforced concrete poles and supports. These poles have proven to be a great deal more durable and sturdy than wooden poles.

ADMINISTRATIVE STRUCTURE

The reorganization of communications in December 1954, in addition to causing many other changes in the Ministry of Communications, also eliminated the small LTUs by incorporating them into enlarged LTUs.¹

LTUs are responsible to the U. S. S. R. Ministry of Communications via the GUMTTS (Glavnoye upravleniye mezhdugorodnoy telefonno-telegrafnoy svyazi—Main Administration of Intercity Telephone-Telegraph Communications) and have to adhere to all its rules and regulations.² On the local level, however, LTU centers are directly subordinate to the kray or oblast communication administrations. The next subordination consists of LUs (lineynyy uchastok—line sections), which are located within a LTU area and are under its direct jurisdiction.³ Recently (1958) the jurisdiction over radio relay lines was transferred to the GUMTTS which is also responsible for its maintenance. For this reason it can be assumed that LTUs will be maintaining radio relay lines.^{3a}

OPERATIONAL STRUCTURE

LTUs are usually located at principal relay communication points, and are in charge of maintenance and repair of cable and overhead lines and possibly radio relay passing through their respective areas. Actually, LTU centers are in charge of maintenance and repair of all the trunk lines and interoblast lines of the U. S. S. R. Ministry of Communications as well as lines of other ministries, administrations, departments, etc., such as the Ministry of Railroad Transportation, which pass through their respective areas.⁴

Depending on the total length of all the long distance telephone-telegraph wires crossing its area, LTU centers also are divided into the following classes:⁵

1. Super class lines with a total length of over 15,000 km of which 3,000 km consists of copper wires.
2. First class lines with a total length of 7,500–15,000 km.
3. Second class lines with a total length of 4,500–7,500 km.
4. Third class lines with a total length of 2,000–4,500 km.

The number of workers in a LTU center is determined in accordance with the volume of operations and the amount of equipment involved. Each LTU has one or more workshops for the repair and maintenance of telephone exchange and telegraph station equipment. It has been indicated that each LTU in the Latvian SSR, for example, has between 200 and 270 workers.⁶

The respective areas under the LTU centers are divided into LUs (Lineynyy uchastok-line section) which are in charge of line maintenance in their respective section and are directly responsible to the LTU centers.⁷

Overhead communication lines, also consisting of cables of considerable length, and probably radio relay, are handled by specialized personnel under the jurisdiction of LTUs.

Besides regular maintenance duties, the 5 LTUs of the Lithuanian SSR, for example, also service all the electrical communications and radiofication in their respective areas. It has been reported that this system has made for greater operational efficiency.⁸

Lists of LTUs are given in later sections of this report.

List of References

1. Vestnik Svyazi, No. 7, 1955, pp. 16-18 (hereafter cited as V.S.)
2. V.S., No. 7, 1958, pp. 20-21.
3. A. N. Gumelya, E. V. Kirillov, and N. V. Luskinovich, Nadsmotrshchik mezhdugorodnykh telegrafno-telefonnykh liniy (The Supervisor of the Intercity Telegraph-Telephone Communication Lines) Moscow, 1955, p. 213.
- 3a. V.S., No. 3, 1959.
4. V.S., No. 12, 1958, pp. 30-31.
5. A. N. Gumelya, Ye. A. Kirillov and N. V. Luskinovich, Nadsmotrshchik mezhdugorodnykh telefonno-telegrafnykh liniy svyazi, Moscow, 1952, p. 205; of A. N. Gumelya, et al, 1955, p. 212.
6. Gumelya, et al., 1952, p. 207.
7. V.S., No. 11, 1958, p. 22.
8. Gumelya, et al., 1952, p. 206.

SECTION 8

CONSTRUCTION, SERVICING AND OPERATING SHORTCOMINGS

It is noted that U.S.S.R. has many construction and servicing problems in the field of telecommunication.

Moscow-Ryazyn: It has been recently stated that terminal stations were not provided with high frequency stand-by equipment for a long time.¹ Although this equipment was later installed it did not function properly because of frequency deviation in the receiver (concerning radio relay).²

By and large the "Strela" apparatus has functioned fairly well. However, there have been cases when resistors burned out, contacts faults have occurred and some tubes have only had life of 100-150 hours.³

Radio-relay construction: It was reported that radio-relay line construction on the Kazan, Yugo-Vostochnaya, Moskov-Kiev, Yuzno-Ural'skaya, Ufa and Donetsk railroads have been unsatisfactory.⁴

Ministry of Communication of the Ukrainian SSR has been urged to speed up the construction of the L'vov-Ternopol radio relay line.⁶

Ministry of Communication of Transcaucasian Union republics was criticizing U.S.S.R. Ministry of Communication because of negligence in assisting in radio-relay problems—with the difficulties in construction of lines, delivery of multiplexing equipment and testing of new radio relay apparatus.⁵

Telephone-Telegraph Lines: Severe magnetic storms are interrupting telecommunication on the following lines: Murmansk-Petrozavodsk, Sverdlovsk-Nizhny Tagil, Sverdlovsk-Tyumen, Ufa-Cheliabinsk and Komsomolsk-Magadan.⁶

Television: Although construction started on television center Cheliabinsk in 1955, in 1958 it was still reported unfinished. The reasons given were the various delays and stoppages in construction.

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There were many delays and stoppages in the construction of the Magnitogorsk and Khabarovsk television centers. In March 1959 it was disclosed that construction of those centers had ceased.⁷

Production: It has been indicated that many radio equipment plants in Moscow-Leningrad and Vladivostok area has produced defective television and radio equipment, and have not supplied repair shops with necessary components.⁸

List of References

1. ATS, No. 8, 1957.
2. Ibid.
3. Ibid.
4. Ibid.
5. V.S. No. 2, 1958, p. 2.
6. V.S. No. 7, 1960.
7. Pravda, July 8, 1958, Radio No. 3.
8. Microwave radio-relay system of the U.S.S.R. Supplement 8.

SECTION 9 EQUIPMENT

RADIO STATION "A"

That station is designed for transmission and reception of telegraph and telephone signals.

Maximum range of telegraph operations, 250 km.

Transmitter and receiver combined in one unit.

Frequency range: 3800–5800 kc (79–51.8 m).

Antenna input power:	higher level telegraph	22–25 watts
	lower level telegraph	12–15 watts
	higher level telephone	10–12 watts
	lower level telephone	6–8 watts

Master oscillator: self-excited.

Receiver: superheterodyne type with same frequency range as transmitter.

Power Supply:

Dynamotor, type "A", 3 commutators, 6, 12, 300 v

Manually driven generator;

Vibrapack.

RADIO STATION "V"

The station is designed for transmission and reception of telegraph and telephone signals.

Maximum range of telegraph operations, 200 km.

Transmitter and receiver combined in one unit.

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Frequency range: 3000-7000 kc (100-42.86 m).

Antenna input power: telegraph operation - 15 watts.
telephone operation - 5 watts.

Master oscillator: self-excited or four fixed crystal frequencies:
3250, 4000, 4750 and 5500 kc.

Receiver: superheterodyne type, same frequency range transmitter.

Power supply:

Hand driven generator, 6.3 and 500 v

Dry batteries. 2 and 90 v.

RADIO STATION RK-0.5

The station is designed for interblast and interregional telegraph and telephone communications.

Range of telegraph operation more than 400 km.

Transmitter RK-0.5 (hf)

Frequency range: 2500-12000 kc (120-25 m), divided into 4 sub-bands.

Antenna input power under telegraph operating conditions,
300-400 watts.

Master oscillator: self-excited crystal controlled.

Receiver PR-4

Frequency range 175-12000 kc, divided into 5 sub-bands.

Superheterodyne, 8 tubes, for telegraph and telephone operations, 110 kc i-f.

Power Supply

Power group consisting of d-c high voltage generator type RDN-2500 or RGN-3000, coupled either with gasoline power set or electric motor. Generator is provided with 2 commutators: 3000 and 20 v.

Dynamotors types RUK-300 and PU-11B.

Storage battery: 3 alkaline cells in series (type 5NKH-100).

RADIO STATION PARKS-0.08

The station is designed for transmission and reception of telegraph and telephone signals.

Range of shortwave telegraph operation 400 km maximum.

Transmitter PARKS-0.08

Two frequency ranges: short-wave 2500-12000 kc (120-25m)
medium-wave 250-600 kc (1200-500m) for
ground wave communications in northern
regions.

Each of the ranges is divided into 4 sub-bands.

Antenna input power: telegraph 30-80 watts
telephone 10-40 watts

Master oscillator: self-excited.

Receiver PR 4

Frequency range 175-12000 kc, divided into 5 sub-bands.
Superheterodyne, 8 tubes, telegraph and telephone operations,
110 kc i-f.

Power Supply

Power group consisting of low voltage generator type GS-1000
or GSK-1500 combined with gasoline power set or electric
motor.

Dynamotors RUK-300 and PU-11AM

Storage battery: 6 cells, type 4NKN-60.

[Reference: Radiooperator, by A. Kh. Yakobson and M. A. Levin
Communications Publishing House, Moskva, 1952.]

SECTION 9

RADIO STATION ZhR-4

The ZhR-4S may be used as a stationary or a mobile station. It has a frequency range from 42.5 to 46.0 mc. Transmitter power is from 1.0 to 30 watts.

[Reference: ATS No. 1, 1957. (A) pp. 22-26: Radiostantsiya ZhR-4]

RADIO STATION RS-25

The RS-25 radio station is to be used for rural communication. Production started in 1953. It is designed for simplex or duplex telephone or telegraph communication on fixed frequencies, which may be set for 300-490 kc, 560-600 kc and 1000-8000 kc.

The station is designed for stationary observation and field service. Power supply is 127-220 v main, 24 v batteries, or a parametric generator.

Receiver sensitivity with telephone is not less than 10 mv; with telegraph, not less than 5 mv. Image attenuation is 46 db at 1000-8000 kc, 60 db at 300-490 kc and 560-600 kc. Audio frequency response is 300-3000 cps, nonlinear distortion is less than 8 percent.

The heterodyne frequency is quartz stabilized, and results in an intermediate frequency of 525 kc.

Transmitter power, telephone or telegraph, is 15-35 watts. Nonlinear distortion is less than 10 percent. Modulation range is 300-3000 cps; anode-screen modulation is employed. Transmitter efficiency is in the 7-12 percent range.

REMOTE CONTROL OF A KV-15/25 SHORT-WAVE TRANSMITTER

The automation of a KV-15/25 transmitter has been conducted at one of the radio centers of the Moscow Directorate of Radio Communication and Radio Broadcasting (MDRSV), and the development of an automation plan has been achieved in the production laboratory. The following technical conditions were assumed as the basis of the plan:

1. Remote starting and stopping of transmitters from an adjacent technical building, with a distance between the transmitter and the panel of approximately 200 meters. Presumably an underground shelter would house the panel.

2. Remote measuring of the basic readings to monitor the quality of the transmitter's operation.
3. The remote changing of four frequencies which are program assigned.
4. An emergency fire signal.
5. A signal concerning the operability of the pump installation of the water cooling system, and automatic transfer to the reserve pump.

On the basis of the automation plan of a single transmitter, a plan for complex automatization of a radio station with several transmitters of the same type will be produced.

Stricter requirements for mechanical and electrical stability present a problem in remotely controlled equipment. In this transmitter, the exciter and the signalling system were changed, as well as the variable inductance circuit coils. Obsolete tubes were also replaced.

In order to obtain the assigned output power of the transmitter during high electro-acoustic readings and also the assigned (3.3 to 23 mc) frequency range, the power stage is provided with a two-cycle circuit. Coupling with the transmission line of the antenna is capacitive.

After redesign, the transmitter had the following specifications:

1. The range of operating frequencies 3.3-23 mc is broken down into sub-ranges: 3.33-4.7 mc; 4.7-8.3 mc; 8.3-23.0 mc.
2. The power and the range is not lower than 20 kilowatts.
3. The coefficient of nonlinear distortion at 100-5000 cps does not exceed 1.5-2.5 percent for a modulation coefficient of 80 percent.
4. The noise level is not higher than 60 db.
5. The practical efficiency of the transmitter is not lower than 35 percent.

[Vestnik Svyazi, Journal of Communications No. 1, 1960, Moscow, pp. 6-8; Russ., per.]

THE VESNA RADIO RELAY SYSTEM

The "Vesna" multichannel radio-relay system is designed for coordinating lines of communication which stretch up to 5,000 km. According to the technical specifications, the "Vesna" system is a single trunk line which carries up to 240 telephone conversations or a black-and-white television program (picture and sound).

The design solutions, construction principles, and stand-by features of the Vesna system make it possible to eliminate maintenance personnel at all intermediate stations of the radio-relay line. Operation is thus simpler and cheaper.

The unattended stations are controlled by a special remote control and signalling system. In addition, for service communications between stations on the radio-relay line, it is possible to transmit up to three duplex telephone conversations. One of these can be separated and inserted only at stations where main trunk line traffic is separated and inserted.

The three service conversations and the remote control and signalling signals are transmitted on a separate high frequency service channel on trunk which operates in the same frequency range as the main high frequency channel of the system. Simplified transmitting and receiving equipment, which differs from the equipment of the main channels, is used on the high frequency service trunk.

The equipment has its own system of automatic standby operation. It should be noted that wire or cable channels can be used for service communications instead of the high frequency channel.

The use of frequency modulation on the main trunks and also on the service trunk permits the telephone channel multiplexing apparatus to be formed from the ordinary units and assemblies which are used for multiplexing long distance cable communication lines.

Television transmission is accomplished via a video spectrum. It therefore differs from the method developed in systems of long range communications. Audio is transmitted by double frequency modulation.

It should be noted that in the development of the "Vesna" system, the future increase of traffic handling capacity to 600 telephone conversations or a color television program has been provided for.

In addition to this, it is possible to automatically switch traffic to a reserve trunk line when one of the main trunks goes out of order. This trunk operates on frequencies other than those of the operating trunks transmitting telephone conversations or carrying a television program. Switching to the "hot" reserve trunk is accomplished on an intermediate frequency, which was selected for the "Vesna" system as 70 mc.

It is contemplated that in the future the number of simultaneously active operating trunks will be increased to five.

Antenna Feeder System

The antenna is a parabolic horn radiator (aperture area 7.5 m^2) with waveguide input. Antenna gain in the operating range of the system is 39–40 db. Radiating surface of the antenna is covered with a lid of dielectric material. The antenna is mounted on a base which permits the direction of radiation to be controlled horizontally and vertically. The height of the antenna is 620 cm, its width is 390 cm, and its depth is 320 cm. The antenna weighs 990 kg without base. The antenna is connected to the apparatus by a hermetically sealed waveguide with a $25 \times 58 \text{ mm}$ cross-section. Dehumidified air is periodically pumped into the waveguide from the instrument room. It should be noted that a periscopic antenna can be used for a smaller number of trunk lines.

Main Trunk Line Equipment

The following racks and frames are included in the main trunk-line equipment:

1. Telephone end frame for modulation and demodulation and also the combination and separation of transmitted traffic spectra (240 telephone conversations and two radio broadcast channels).
2. Television end frame where modulation or demodulation and the combination and separation of the television program and its sound accompaniment program takes place.
3. High-frequency receiver and transmitter rack for receiving, amplifying and heterodyning. In this rack, amplification and connection between the receiver and transmitter take place at a frequency of 70 mc.
4. Multiplexing equipment rack.

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Such a configuration of the "Vesna" system's main trunk-line equipment permits using the high-frequency receiver and transmitter rack without redesign at either the intermediate, terminal, or main (junction center) stations. The end frames are connected to the high-frequency receiver and transmitter rack on an intermediate frequency of 70 mc.

Terminal Telephone Rack

The terminal telephone rack consists of two modulator blocks and two demodulator blocks, one of which is operative and the other is reserve. Switching is made by the service personnel.

The oscillation with the group spectrum of 240 telephone conversations (60–1052 kilocycles) and two broadcast channels is fed to the modulator block from the consolidating equipment. After preliminary amplification and composition in the block of filters, the oscillations with the total spectrum are fed to the klystron generator. For the purpose of decreasing nonlinear distortions, this generator has a resonance system consisting of two coupled circuits, the "Q" of the secondary one can be adjusted.

The effective deviation in the frequency for one telephone conversation, obtained in the terminal telephone rack, corresponds to the recommendations of the MKKTT and the MKKR and is equivalent to 200 kilocycles.

[Reference: Vestnik Svyazi, No. 5 and 6, 1958, Moscow.]

R-60/120 RADIO RELAY APPARATUS

The R-60/120-type equipment is intended for multichannel telephone communication and transmission of TV signals. The transmission frequencies in TV and telephone trunks (stvoly) extend to the 6 mc 300 to 552 kc bands, respectively. Service channels operate over the 300 kc to 6 mc bands. Intermediate stations operate unattended. Up to ten intermediate stations are attended by one main office.

Power supply is 220 v, 50 cycle, single-phase. The equipment consists of high-frequency, low-frequency, automation, and antenna-and-feeder consoles.

The transmitter-receiver terminal (main) station has an i-f of 70 mc (f-m). The operating frequency of the apparatus 1614-1972 mc. Transmitter power is 3 watts, receiver-noise coefficient is 30 and the bandwidth is 20 mc, with a frequency deviation of 100-200 kc per channel (telephone) or ± 4 mc (television).

In each radio-relay line station equipped with the R-60/120, there is one terminal equipment set. The set comprises a service-channel, speak-call device, terminal TV sound-channel equipment, and terminal TV-channel video amplifiers.

The automation-and-teleservicing equipment, which serves a single station, comprises an automatic high-frequency console-reservation equipment, remote-signal system, and telecontrol. The range is 2500 km and the line capacity consists of 3 high-frequency trunk lines, divided into two duplex telephone lines which can handle 60 channels each and a single simplex TV channel.

The periscopic antenna is the basic antenna system in the R-60/120; a parabolic antenna is also used.

Preparation for batch production of the R-60/120 was underway in 1957.

[Reference: Vestnik Svyazi, No. 9, 1957, pp. 3-7: Radioreleynaya apparatura R-60/120.]

"STRELA M" UHF RADIO-RELAY APPARATUS

Working Frequency: 1767-1955 mc.

Output Power: 2 watts.

Frequency range of the group channel: 12-108 kc. (This corresponds to the frequency spectrum of K-24 multiplex apparatus which is used with "Strela M".)

Audio frequency of the communication channel is 300-3000 cps.

Line capacity: 24 telephone channels

Antennas: Periscopic type.

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"Strela M" is built to work with a "Strela T" relay station. ('T' for television).

[Reference: A. T. S., No. 7, 1957, pp. 25-27.]

RRS-1 MULTICHANNEL RADIO RELAY APPARATUS

This equipment is of a mobile vhf type, handling duplex transmissions and operating on FM.

Range: 45 km and up to 120 km if two repeaters are used. (This distance may be increased if higher antenna masts are used).

Operating frequencies: 66.0-69.975 mc.

Capacity: duplex operation of 2 telephone and 2 telegraph channels.

Power supply: 127/220 v a-c, single phase, or storage batteries.

[Reference: "Avtomatika, Telemekhanika i Svyaz," No. 5, 1958, p. 10-12.]

RM-24 RADIO RELAY APPARATUS

The RM-24 radio relay apparatus, which is produced in Hungary, is currently used on small radio relay lines.

Operating frequency: 1900-2050 mc.

Operating range: up to 1000 km.

Capacity: up to 22 duplex telephone channels, 1 service channel, 1 channel for synchronous signals, with time division multiplexing.

[Reference: Avtomatika, Telemekhanika i Svyaz, December 1958, No. 12, p. 10.]

K-60 60-CHANNEL MULTIPLEXING APPARATUS

The K-60 is intended for use in multiplexing inter-city telephone cable lines, and for multiplexing radio-relay lines with up to 240-300 channels. The K-60 contains 3 types of intermediate line amplifiers, one without AVC, one with single-frequency AVC, and one with three frequency AVC. The first is intended for use in unmanned repeating

stations (NUP) and includes an automatic reserve amplifier complex. The amplifier with single-frequency AVC is intended for use in manned repeating stations, and has no reserve complex. The circuit contains a compensating circuit with TKP-50 type thermistor. The amplifier circuit with 3-frequency AVC is similar in principle to the amplifier with single frequency AVC, and may be used as a receiver amplifier at terminal stations without any changes.

Control variation in damping the controlling circuits is done through TKP-50 thermistors or a group of resistors. Three frequency level control (AVC) is available in the K-60, at 248, 16, and 112 kc., but single frequency control is most commonly used; level control is thermoelectric.

Frequency conversions in the K-60 at terminal stations, is in 3 stages from individual channel to a group of 5, 12-channel groups, then to the 60 channel group, and finally to the line frequency spectrum.

Introduction of a control frequency at 411.86 kc in the 60-channel group of the transmitting section, necessary when the K-60 system is operating together with a system of multiplexed coaxial cable or radio-relay line, is envisaged. The receivers for this control frequency, to be connected at the output of the receiving section of 60-channel group, will not be included in the K-60 itself.

The basic circuit of frequency generating equipment is a 4 kc oscillator. All carrier currents are harmonics of 4 kc, or the related frequency of 12 kc. Control currents, except that at 84.14 kc, are obtained by means of mutual conversion of the most convenient carrier-frequency.

Capacity of the generating equipment is 480 channels, or 8 systems, i.e., complete multiplexing of a 4-quad cable.

A part of the generating equipment can be used in the modernized K-24-2 apparatus, for which purpose the group carrier frequency of 120 kc and control currents of 64 and 104 kc, not used in K-60, are available.

The required power is supplied by 450 v d-c cables.

[Reference: Vestnik Svyazi, No. 2 and 3, 1959.]

SECTION 9

RADAR NAVIGATIONAL STATIONS

Table 2 shows performance factors for three radar navigational stations. The references following contain detailed description of radar stations in use with the Soviet maritime fleet. Coastal Stations are not covered in this report.

Table 2. Three Radar Navigational Stations

Performance Factors	Type of Radar Station:														
	Sivor ¹	Neptun ²	Don ³												
Destination	Aid to navigation. Designed for installation aboard fishing ships.	Aid to navigation. Designed for installation aboard ships of at least 600 tons.	Aid to navigation. Designed for almost similar purposes as the station "Neptun" but of a higher standard.												
Range scales (miles)	0.5; 1; 2.5; 10 and 25	1.5; 5; 15 and 30	0.8; 2.5; 5; 15; 30 and 50.												
Range accuracy	Not more than 4 percent of corresponding scale maximum range rating.	3 percent for 1.5 and 5 mile scales 0.6 percent for 15 and 30 mile scales	<table><tr><th>Scale (miles)</th><th>Range (meters)</th></tr><tr><td>0.8</td><td>25</td></tr><tr><td>2.5</td><td>50</td></tr><tr><td>5</td><td>80</td></tr><tr><td>15</td><td>170</td></tr><tr><td>30</td><td>340</td></tr></table>	Scale (miles)	Range (meters)	0.8	25	2.5	50	5	80	15	170	30	340
Scale (miles)	Range (meters)														
0.8	25														
2.5	50														
5	80														
15	170														
30	340														
Bearing accuracy	max. 2 degrees	max. 2 degrees	appr. 1 degree												
Maximum range (miles)	25	30 after accurate tuning and fulfilling all the preventive measures	50												
Minimum range (meters)	30 meters on 0.5 mile scale with the antenna elevated 6 m above sea level	100-120 meters on 1.5 mile scale	35 meters												
Range resolution (meters)	40 meters	90 meters on 1.5 and 5 mile scales 150-200 meters on 15 and 30 mile scales	Similar figures to range accuracy												
Bearing resolution	2 degrees	2 degrees	2 degrees												

Performance Factors	Type of Radar Station		
	Sivor	Neptun	Don
Presentation	P. P. I., 230 mm (Plan Position Indicator)	P. P. I., basic indicator 230 mm. remote indicator 180 mm.	P. P. I. 310 mm.
Antenna gain	700	1,000-1,100	1,000
Antenna beam width	1.7 degrees in horiz. plane	1.6 degrees in horiz. pl. 14 degrees in vert. pl.	1.2 degrees in horiz. pl. 20 degrees in vert. pl.
Antenna rotation	24 rpm	15 rpm	12 rpm
Frequency	9,400-9,460 mc	9,400-9,460 mc	9,400-9,460 mc
Radio frequency source	Magnetron	Magnetron	Magnetron
Peak power	80 kw	40 kw	80 kw
Consumed power	maximum 2 kw	2.3-3.3 kw depending on the type of power supply unit	maximum 3.2 kw
Pulse rate	2,000 cps	2,700 cps on 1.5 and 5 mile scale; 675 cps on 15 and 30 mile scales	3,200 cps on 0.8 and 2.5 mile scales; 1,600 cps on 5 mile scale 800 cps on 1,530 and 50 mile scales.
Pulse width (microseconds)	maximum 0.1	0.25 on 1.5 and 5 mile scales 1 - on 15 and 30 mile scales	0.12 on 0.8 and 2.5 mile scales 0.5 on 5 mile scale and 1 on the 1530 and 50 mile scale
Receiver sensitivity (decibels in relation to one watt)	106-108	120	113
Remarks	The first model of radar station installed aboard Soviet river ships ⁴	Provided with special ranging device. Set in position "Reserve" can operate with radar beacons.	A number of alterations are presently being introduced into this station.

References:

1. M: Morskiye radiolokatsionnyye stantsii (Maritime Radar Stations) by Zizemskiy, E. I., State All-Union Publishing House of Shipbuilding Industry, Leningrad, 1959, pp. 25, 26, 31 and 55;
2. Ibid, pp. 168-169, 171 and 185.
3. Ibid, pp. 71-75, 99, 107 and 109.
4. M: Posobiye sudovomu radistu (Ship radio operator's manual) by Konstantinov, V. P. published by P: "River Transport", Moskva, 1959, p. 291.

PART 2
TELECOMMUNICATIONS FACILITIES IN THE SOVIET UNION
BY AREAS

SECTION 10
EUROPEAN U.S.S.R.**LOCATIONS OF RADIO COMMUNICATION CENTERS**

<u>Location</u>	<u>Administrative-Territorial Division</u>
Ufa	Bashkirskaya ASSR, RSFSR
Minsk	Minskaya Oblast', Belorusskaya SSR
Cheboksary	Chuvashskaya ASSR, RSFSR
Simferopol'	Krymskaya Oblast', Ukrainskaya SSR
Tallin	Estonskaya SSR
Gor'kiy	Gor'kiy Oblast, RSFSR
Ivanovo	Ivanovskaya Oblast', RSFSR
Kaliningrad	Kaliningradskaya Oblast' RSFSR
Petrozavodsk	Karel'skaya ASSR, RSFSR
Khar'kov	Khar'kovskaya Oblast', Ukrainskaya SSR
Kiev	Ukrainskaya SSR
Kursk	Kurskaya Oblast', RSFSR
Kuybyshev	Kuybyshevskaya Oblast', RSFSR
Riga	Latviyskaya SSR
Leningrad	Lenigradskaya Oblast', RSFSR
L'vov	L'vovskaya Oblast', Ukrainskaya SSR
Kishinev	Moldavskaya SSR

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Moscow	U. S. S. R. and RSFSR
Noginsk	Noginsk Rayon, Moscow Oblast', RSFSR
Odessa	Odesskaya Oblast', RSFSR
Orenburg (formerly Chkalov)	Orenburgskaya Oblast', RSFSR
Rostov	Rostovskaya Oblast', RSFSR
Saratov	Saratovskaya Oblast', RSFSR
Stalingrad	Stalingradskaya Oblast', RSFSR
Stalino	Stalinskaya Oblast', Ukrainskaya SSR
Kazan'	Tatarskaya ASSR, RSFSR
Uzhgorod	Zakarpatskaya Oblast', Ukrainskaya SSR
Vil'nyus	Litovskaya SSR
Voronezh	Voronezhskaya Oblast', RSFSR
Murmansk	Kola Gulf (Source: Vestnik Svyazi, No. 11, 1945, p. 3., <u>(Old source- possibly exists)</u>)
Dnepropetrovsk	Dnepropetrovskaya Oblast', Ukrainskaya SSR
Nikolayev	Nikolayevskaya Oblast', Ukrainskaya SSR

RADIO RELAY LINES

Line:	KIEV-TERNOPOL-LVOV-UZGOROD ¹
Note:	It is planned that Uzgorod will be connected with Praga and Budapest. This line is supposed to be finished before 1965. ¹ Work on Lvov-Ternopol link is supposed to be speeded up. ²
Line:	MOSKOW-GOMEL-KIEV ¹
Note:	Is supposed to be finished before 1965.
Line:	MOSCOW-KIEV
Note:	This line is built for railroad communication, and building progress is reported as unsatisfactory.

Line: KIEV-KHERSON²

Links: Cherkasy, Kirovograd, Poltava, Kharkov, Dnepropetrovsk and Nikolaevsk Oblast'. (There is a possibility for connection between Kherson and Odessa through the line which is built for TV transmission.

Line: KHARKOV-DNEPROPETROVSK-ROSTOV ON DON⁸

Note: The sources do not state if it is radio relay line or a cable

Line: KIEV-KISHINIEV¹

Note: This line will be further connected to Bucuresti.

Line: MOSCOW-KALUGA-OREL-KURSK-KHARKOV-DNEPROPETROVSK-SIMFERPOL³

Equipment: "Modern Soviet Apparatus"⁴ using horn type antenna. Beside telephone channels it has simplex TV channel⁵

Power Supply: Local network plus emergency generator or batteries.

Connections: This line connects the following radio relay lines:

Briansk-Orel
Kiev-Kherson
Dnepropetrovsk-Rostov

Note: Moscow-Kharkov link is in operation. It has 18 repeater stations¹ and additional TV channels were recently added.^{6, 7} Kharkov Bielgorod started operating in late 1959.⁵ The Bielgorod-Simferpol link will be ready before 1965.³

Line: KRIVOY ROG-(Trunk Line)

Note: Krivoy Rog will be connected to the main line, possibly at Kirovograd to Kiev-Kherson trunk.¹¹

Line: BRIANSK-OREL⁴

Equipment: Unknown but using KRR 30/60 or K-24 multiplex unit.⁴ Ready before 1965.

Line: CHERKASY-POLTOVA-KHARKOV

Equipment: Unknown; has TV channels

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Note: Most probable connection between Kiev-Kherson line and Moscow-Dnepropetrovsk. According to our source,² this connecting link goes through Poltova. Ready before 1965.

Line: MOSCOW - TULA - VORONEZH - VOROSHILOVGRAD ROSTOV^{1, 9, 10}

Note: This line partly follows Moscow-Stavropol gas line. It was reported finished in 1960.¹⁰

Line: TAMBOV - LIPETSK Line (MOSCOW - ROSTOV)

Note: Supplementary line connected probably at Yellets.¹¹

Line: VOROSHILOVGRAD - STALINO¹²

Note: This line was under construction in 1957.¹³

Line: ROSTOV - SHAKTY^{19, 20}

Note: This line is being built for railroad communication.

Line: LENINGRAD - TALLIN - RIGA - KANNAS - VIL'NUS - MINSK

Line Capacity: 240 telephone channels and TV line.

Note: Leningrad-Tallin link reported ready (1958). This line was supposed to extend to Vil'nus and Minsk by 1959. (It will eventually be extended through the entire Baltic area and Bialo-russian SSR)^{12, 14, 15}

Line: KLAYPEDA - VIL'NUS

Note: Reported ready and under tests in October 1960.¹⁰

Line: RIGA - TAKUM - KULDIGA

Equipment: "Strela M and T"

Length: 135 Km.

Note: This line has 2 repeater stations in Takum and Sabile and is already in operation^{16, 17, 18}

Line: RIGA - DAUGAVPILS¹⁹

Note: This line is being built for railroad communication.²⁰

Line: VALGA-PSKOV²¹

Note: This line was supposed to start operation in 1959-1960.

Line: Leningrad-Moscow
Note: This line will be built for railroad communication. ¹¹
Line: Leningrad-Petrozavodsk ^{8, 12}
Note: This line is supposed to be ready before 1965.
Line: Leningrad-Minsk
Note: Work began on this line in 1958. ¹
Line: Moscow-Smolensk-Minsk
Equipment: Moskva-Smolensk section is using R-60 apparatus ²⁹
Note: The Moscow-Smolensk link was reported completed and in operation in December 1958. ^{22, 23} Smolensk-Minsk section will be finished before 1965. ¹
Line: Moscow-Yaroslavl-Ivanovo-Kostroma ^{12, 24}
Equipment: Using KRR 30/60 or K-24 multiplex equipment ²⁹
Note: This line has 5 repeater stations in operation.
Line: Moscow-Stalinogorsk
Note: In Operation ³¹
Line: Yaroslavl'-Vologda-Arkhangelsk-Murmansk
Note: This line will increase the capacity of telephone channels between the above mentioned towns by four times. ⁸
Line: Moscow-Vladimir-Gorkiy-Kazan-Perm (Molotov)-Sverdlovsk-Khabarovsk-Vladivostok ¹
Equipment: Unknown. This line will have to be divided into two parts because of the range of the radio-relay system. It will have telephone and TV channels.
Note: The Moscow-Vladimir and Perm (Molotov)-Sverdlovsk line is in operation. The entire line is supposed to be finished before 1965. This will be the most important line in the U.S.S.R. and will be linked with China. ¹ The location of the line on the map is only approximate because there were no data available but material showing the planned improvement and need of such a line in the southern part of Siberia was taken into consideration.

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Line: GORKIY-KOTELNICH-KIROV-ZVEYKA-PERM (MOLOTOV) ⁸

Note: This line will permit the increase of telephone channels by 4 ⁸ and will probably carry TV programs from Kirov to Kotelnich and Zveyka. ²⁷

Line: BEREZNIKI-(SVERDLOV-MOSCOW) LINE ¹⁴

Note: Supplementary line will connect to the trunk line probably at Perm (Molotov).

Line: Izhevsk-(SVERDLOVSK-MOSCOW) LINE ⁴

Note: Supplementary line will connect to the trunk line.

Line: MOSCOW-RYAZAN'

Equipment: "Strela M and T" (and K-24) multiplex apparatus.

Note: This line has reserve equipment and power supply. The relay station is located at Bronnitsy, Peski and Podlipki. This line is also used for railroad communication and has telephone and TV channels. Fully automatic telephone communication between Moscow and Ryazan is being used on this link, which is in operation. ^{25, 26}

Line: RYAZYN-SASOV PENZA-KUYBYSHEV ¹²

Note: This line may be used to carry Kuybyshev TV programs to Syzran.

Line: KUYBYSHEV-CHELYABINSK-NOVOSIBIRSK

Note: The line will increase its telephone channels capacity by two. ⁸ This line will probably be used for transmitting TV programs to Pokhvistnevo. ²⁸

Line: UFA-SALAVET ¹³

Note: Small supplementary lines.

Line: KUYBYSHEV-CHKALOV ¹²

Note: No further information available.

List of References for Radio Relay Lines, European U. S. S. R.

1. Moskovskaya Pravda, December 27, 1958.
2. Pravda Ukrainy, November 29, 1957-CIA, No. 2, p. 55.
3. Pravda, May 7, 1958.
4. V.S., No. 1, 1960.
5. V.S., No. 3, 1960.
6. V.S., No. 8, 1960.
7. V.S., No. 9, 1960.
8. V.S., No. 2, 1959.
9. Zarya Vostoka, May 7, 1958.
10. V.S., No. 10, 1960.
11. Radio, No. 5, 1959, p. 10.
12. Map from IR-1519-58, Microwave radio relay system in U. S. S. R.
13. V.S., No. 9, 1957, p. 1-2.
14. Sovetskaya Estonia, November 7, 1958.
15. Literaturnaya Gazeta, November 28, 1958.
16. Radio, No. 3, 1959, pp. 3-5.
17. V.S., No. 3, 1959, p. 13.
18. Sovetskaya Latviya, July 5, 1958.
19. A.T.S., No. 11, 1958, pp. 18-20.
20. A.T.S., No. 1, 1958, pp. 3-7.
21. Sovetskaya Rossiya March 30, 1958, CIA, No. 6, p. 75.
22. Verchernyaya Moskva, No. 29, 1958.
23. Pravda, December 4, 1958.
24. Pravda, May 2, 1958.
25. A.T.S., No. 7, 1957, pp. 25-

26. A.T.S., No. 8, 1957, pp. 27-28.
27. Izvestiya, July 20, 1958, p. 6.
28. Pravda, March 14, 1958, p. 4.
29. Elektrosaias, No. 5, 1958, p. 3.
30. A.T.S., No. 5, 1958.
31. Pravda, February 26, 1958.

RADIO COMMUNICATION

Besides having many radio communication centers (see list) European U.S.S.R. has a multitude of stations for internal and international communication, for air communication and for marine use.

The areas which have large amount of stations are shown on the map as shaded.

Between Leningrad and Moscow we have the first and, at present, only confirmed communication with ionospheric dispersal, still in the experimental stage.¹

The specifications of this line are as follows:

Transmitter power	- 8 kw
Frequency	- 32-42 mc
Antenna	- single rhombic

This line was supposed to be connected for permanent use with the following specifications:

Transmitter power	- at least 16 kw
Frequency	- 36-37 mc (preferred)
Antenna	- improved type ¹

WIRE COMMUNICATION: EUROPEAN U.S.S.R.

Only new and very important wire communication lines are shown in this report. Moscow is linked by trunk lines with regions along the Urals, Siberia, Ukraina, Caucasus, Kasak and Far East.²

By 1960-1962 Moscow will be linked by coaxial trunk lines with capitals of several foreign countries, making it possible to exchange television programs with them.³

It is planned to link Moscow with Warsaw, Berlin and Prague. ⁴

At the present time the following cable lines are being constructed in European U. S. S. R.

Moscow - Gomel - Kiev (Construction of this line is finished) ⁵

Moscow - Minsk ⁶

Vitebsk - Smolensk ⁶

There is also Kharkow - Dnepropetrowsk - Rostov on Don Line planned but it is not stated if its cable or radio relay line. ⁷

Moscow - Leningrad cable line will be reconstructed and will include TV channels. This cable was supposed to be ready at the beginning of 1961. (Since it is only an improvement this line is not shown on the map). ⁷

TELEPHONE COMMUNICATION

Within the present Seven-Year-Plan the following telephone lines will be automated:

Moscow - Leningrad

Moscow - Kharkow - Dnepropetrowsk

Moscow - Gorki - Kazan - Perm (Molotov)-
Sverdlovsk ⁴

Moscow - Kiev - Lvov ⁸

List of References (Radio, Wire and Telephone Communication)

1. V. S., No. 10, 1960.
2. Literaturnaya Gazeta, November 27, 1958.
3. V. S., No. 12, 1958.
4. Radio No. 5, 1959, p. 10.
5. V. S., No. 8, 1960.
6. Sovetskaya Belorussiya, October 26, 1958.
7. V. S., No. 2, 1959, pp. 2-3.

MOSCOW-KHABARNOVSK TRUNK LINE (Overhead Line)¹

Type: Telegraph/Telephone

Length: 8.715 km plus Khabarnovsk-Vladivostok extension

SECTION 10

Capacity of Line:

In 1939 the line had a capacity of 12 telephone circuits on 4 pairs of copper wire, plus 18 two-way telegraph transmissions.¹ In 1955, V-3 multiplex equipment was installed on one of the circuits.²

This is the most important telecommunication line in the U.S.S.R. It connects Moscow with Siberia and The Soviet Far East.

The lines run mainly along Transybeviion railroad and consists of two trunks. One belongs to the Ministry of Communication and the second to the Ministry of Railroads.¹

This line is an old one and is not shown on the map.

List of References:

1. Izvestia, 27 December 1939.
2. V.S., No. 10, 1957, pp. 5-10.

LIST OF LINE TECHNICAL CENTERS (LTUs) (EUROPEAN U.S.S.R)

<u>Location</u>	<u>Administrative Territorial Division</u>
Astrakhan'	Astrakhan Oblast' RSFSR
Bel'Tsy	Moldavian SSR
Glazov	Udmurt ASSR RSFSR
Gor'kiy	Gor'kiy Oblast RSFSR
Izhevsk	Udmurt ASSR RSFR
Kaunas	Lithuanian SSR
Kiev	Kiev Oblast' Ukrainskaya SSR
Kishinev	Moldavian SSR
Krasnyye Baki	Gor'kiy Oblast' RSFSR
Krasnoslobodak	Mordvian ASSR RSFSR (which only has one other LTU - i.e. Saranskiy LTU)

Krasnoufimsk	Sverdlovsk Oblast' RSFSR
Kursk	Kursk Oblast' RSFSR
Leningrad	Leningrad Oblast' RSFSR
Michurinsk	Tambov RSFSR
Moscow	(Moscow Oblast') RSFSR
Murmansk	Murmansk Oblast' RSFSR
Nikolayev	Nikolayev Oblast' Ukr. SSR
Pechora	Komi ASSR RSFSR
Poltava	Poltava Oblast' Ukr. SSR
Pskov	Pskov Oblast' RSFSR
Rezekne	Latvian SSR
Riga	Latvian SSR
Saransk	Mordvian ASSR RSFSR
Smolensk	Smolensk Oblast' RSFSR
Stanislav	Stanislav Oblast' Ukr. SSR
Tallin	Estonian SSR
Tikhvin	Leningrad Oblast' RSFSR
Tula	Tula Oblast' RSFSR
Vil'nyus	Lithuanian SSR
Yaroslavl'	Yaroslav Oblast' RSFSR
Yelgava	Latvian SSR
Zelenogorsk (Terioki)	Leningrad Oblast' RSFSR

LTU Reference Notes

1. V.S., No. 8, 1955, pp. 16-17.
2. V.S., No. 9, 1956, inside front cover.
3. V.S., No. 4, 1957, pp. 24-27.
4. V.S., No. 8, 1955, p. 23.

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5. V.S., No. 7, 1955, pp. 16-18.
6. V.S., No 4, 1957, pp. 24-26 .
7. V.S., No. 7, 1955, pp. 16-18.
8. V.S., No. 10, 1958, pp. 44-45.
9. V.S., No. 3, 1957, p. 18.
10. V.S., No. 12, 1958, pp. 25-26.
11. V.S., No.12, 1958, pp. 25-26.
12. V.S., No. 10, 1956, pp. 16-17.
- 12a. V.S., No. 8, 1958, pp. 21-22.
- 12b. V.S., No. 3, 1957, p. 18.
13. V.S., No. 10, 1957, p. 42.
14. V.S., No. 9, 1956, inside front cover .
15. V.S., No. 3, 1957, pp. 15-17.
16. V.S., No. 7, 1959, pp. 16-18.
17. V.S., No. 8, 1955, pp. 28.
18. V.S., No. 10, 1956, pp. 19-20.
19. V.S., No. 3, 1957, pp. 15-17.
20. V.S., No. 12, 1958, pp. 25-26 .
21. V.S., No. 9, 1955, inside front cover.
22. V.S., No.2, 1955, pp. 22-23.
23. V.S., No. 10, 1958, pp. 61-62.
24. V.S., No. 11, 1954, inside back cover.
25. V.S., No. 9, inside front cover.
26. V.S., No. 3, 1957, p. 23.
27. V.S., No. 4, 1955, pp. 18-19.
28. V.S., No. 4, 1957, pp. 24-26.
- 28a. V.S., No.9, 1956, inside front cover .
29. V. S., No.1, 1956, p. 19.
30. V.S., No. 3, 1957, pp. 15-17.

31. V.S., No. 9, 1956, inside front cover.
32. V.S., No. 6, 1957, pp. 1-3.
33. V.S., No. 6, 1958, p. 22.
34. V.S., No. 10, 1956, pp. 16-17.
35. V.S., No. 4, 1955, pp. 18-19.
36. V.S., No. 9, 1957, p. 2.
37. V.S., No. 8, 1956, pp. 22-25.
38. V.S., No. 9, 1957, p. 2.
39. V.S., No. 8, 1955, p. 23.
40. V.S., No. 12, 1958, pp. 25-26.
41. V.S., No. 3, 1957, pp. 15-17.
42. V.S., No. 10, 1957, p. 44.
43. V.S., No. 5, 1957, pp. 25-26.
44. V.S., No. 4, 1955, pp. 18-19.
45. V.S., No. 3, 1957, p. 26.
46. V.S., No. 2, 1954, p. 14.
47. V.S., No. 9, 1955, p. 21.
48. V.S., No. 12, 1958, p. 14.
- 48a. V.S., No. 12, 1955, p. 19.
49. V.S., No. 2, 1954, p. 20.
50. V.S., No. 10, 1957, p. 30.
51. V.S., No. 12, 1956, p. 23.
52. V.S., No. 10, '956, pp. 16-17.
53. V.S., No. 9, 1955, inside front cover.
- 53a. V.S., No. 8, 1955, pp. 16-17.
54. Ir-1380-58.

SECTION 11

CAUCASUS

RADIO AMATEUR ACTIVITIES

One of the very important developments in communications in Transcaucasus has been the expansion of the radio amateur movement. In the past several years, many radio amateurs were trained under the supervision of DOSAAF (All Union Volunteer Society for the Promotion of the Army, Navy and Air Force).¹

There are several radio-amateur clubs in Caucasus: The most important one:² at Baku, with over 250 members and branches in Leninskiy and Stalinskiy, Tbilisi, Rustavi, Batumi and Yerevan.³

RADIO RELAY LINES

Line: BAKU-SHEMAKA YEVLAKH-KIROVOBAD

Length: 355 km.

Note: This line has 8 repeater stations and is operating.^{4, 5}
Will have TV channel.¹⁴

Line: KIROVOGRAD-TBILISI

Note: No further information available⁶
Will have TV channels¹⁴

Line: YEREVAN-KIROVAKAN-STEPANOVAN-ALAVERTI-
ARARAT VALLEY-TBILISI

Note: This line will be completed in 1962 and will provide 24-hour telephone communication and will have TV channel.^{7, 8}

Line: TBILISI-ROSTOV-MOSCOW

Note: This line was supposed to be ready⁹ in 1960.

The following lines will be built before 1965. (There is no information concerning equipment and capacity of lines):

SECTION 11

BAKU-KUBA
NUKHTA-YEVLAKH-STEPANAKERT
NAKHICHEVAN-YEREVAN
YEREVAN-LENINAKAN
GORI-STALINGORI
BATUMI-KUTAI
SUKHUMI-KUTAI
ZESTAFONI-CHIATURA^{6, 10, 11}

TV RELAY STATIONS

There is a possibility that TV relay lines may also be used for telephone and telegraph communications. Those lines and stations being primarily for TV purposes are not shown on the map.

TBILISI TV program
is sent to:

GORI
BOLNOSI
STALINIRI
TEVALI¹²

TBILISI TV program
will be sent to:

GURDZHAANI
DUSHETI
LENINGORI¹²

SOCHI TV program
will go to:

SUKHUMI¹³

List of References (Radio Amateur, Radio Relay, TV Relay)

1. Bakinskoy Rabochiy, May 7, 1954
2. Radio, No. 12, 1957
3. Radio, No. 1, 1957, p. 5, 11, 34
4. Stroitel'naya Gazeta, September 4, 1960
5. Bokinskii Rabochiy, December 18, 1958
6. Zarya Vostoka, January 1, 1958, p. 2
7. Yerevan Kommunist, August 24, 1960

8. Zarya Vostoka, May 7, 1958
9. Moskovskaya Pravda, December 27, 1958
10. Kommunist, May 7, 1957
11. I. R. 1814-58—Communication in Transcaucasus
12. V. S., No. 6, 1958, p. 15-16
13. Zarya Vostoka, March 15, 1959
14. Radio, No. 5, 1959

LOCATIONS OF RADIO COMMUNICATION CENTERS

<u>Location</u>	<u>Administrative-Territorial Division</u>
Baku	Azerbaydzhanskaya SSR
Tbilisi	Gruzinskaya SSR
Ordzhonikidze (Dzardzhikau)	Severo-Osetinskaya ASSR, RSFSR
Sochi	Krasnodarskiy Kray, RSFSR

LIST OF LINE TECHNICAL CENTERS (LTUs)

<u>Location</u>	<u>Administrative-Territorial Division</u>
Armavir	Krasnodar Kray RSFSR
Khashuri	Georgian SSR
Krasnodarsk	Krasnodarsk Kray RSFSR
Pyatigorsk	Stavropol' Kray RSFSR
Samtredia	Georgian SSR
Stavropol'	Stavropol' Kray RSFSR
Tbilisi	Georgian SSR

SECTION 11

LIST OF AIRPORTS USED BY COMMERCIAL AIRLINES AND ADMINISTRATIVE OF NORTHERN SEA ROUTE

Baku*

Grozny

Makhachkala

Ordzkonikidze*

Sochi*

Tbilisi*

Yerevan*

* Principal Airports

Source: Oxford Regional Economic Atlas, 1956.

SECTION 12

CENTRAL ASIA

RADIO COMMUNICATIONS

Kazajskaya SSR

In 1956, about 200 radio stations were set up with Radio Correspondents who started cooperation with local hydrometeorological stations throughout Kazakhskaya SSR.

The duties of radio correspondents consists of transmitting weather information and storm warnings to hydrometeorological stations and graziers. The locations of those stations on the map are very approximate because the source material is in the very small scale (map).⁷

Kirgiz SSR

Radiotelephone communication in this area is of very great importance because of the mountainous conditions of Kirgiz. Field receivers-transmitters are widely used (we do not have any source material showing locations of those stations). They are installed in livestock pastures areas, at hydro-enterprises and at geological and meteorological points of Tien Shan.⁸

Uzbek SSR

Tashkent has point to point radiotelegraph channel to Kabul (Afghanistan).³³

RADIO COMMUNICATION CENTERS

<u>Location</u>	<u>Administrative-Territorial Division</u>
Alma-Ata	Kazakhskaya SSR
Chimkent	Yuzhno-Kazakhstanskaya Oblast', Kazakh SSR

Stalinabad	Tadzhikskaya SSR
Ashkhabad	Turkmenskaya SSR
Ural'sk	Zapadno-Kazakhstanskaya Oblast', Kazakhskaya SSR
Tashkent	Uzbekskaya SSR
Gur'yev	Gur'yevskaya Oblast', Kazakhskaya SSR

LINE TECHNICAL CENTERS (LTUs)

ASHKABAD²⁶
 KZYL ORDA²⁷
 NUKUS²⁸
 STALINBAD⁴
 TASHKENT²⁹

(Reference numbers pertain to list in section on LTUs of European U. S. S. R.)

SPECIAL SERVICE STATIONS

Station Transmitting Time Signal

Station:	Call Letters:	Frequencies in kc:	Time: GMS
TASHKENT	RPT	5890 11580 14650	1000 1800

Source: Recapitulatory Supplement No. 8; ITU. Information to July 31, 1960.

RADIO RELAY LINES

Line: BAKU - KRASNOVODSK - ASHKABAD - BUKHARA -
STALINABAD^{9, 36}

Note: This line was supposed to be connected shortly by radio relay line with the Tashkent - Alma Ata line (Source of January 1958). There is no indication of the type of connection through the Caspian Sea for this radio relay line. Two of our sources state that there is undersea cable (wire connection) across this sea.^{23, 37} According to our sources³⁵ this line runs through Mary Bukhara and Samarkand.

Line: BUKHARA - TASHKENT¹⁰

Note: This line will be built alongside gas pipelines and will be ready in 1962.

Line: TASHKENT - CHIMKENT - KZYL ORDA - AKTYOBINSK - CHAKOLOV - KUYBYSHEV³⁶

Note: No particulars known about this line.

Line: TASHKENT - FARGANA - NAMARGAN¹¹

Note: This line is reported to be already in operation.

Line: FRUNZE - DZHELAL - ABAD - OSH¹²

Equipment: U. S. S. R. built equipment using 12-channel system (installed March 1956). The system has TV channels. Electric-feeder systems use power obtained from the nearby towns.

Note: The line is 334 km. long and consists of two terminal stations in the towns of Frunze and Osh. One main station in the town of Dzhelal-Abad, and two high-mountain stations on Kirgiz and Fergan mountain ridges. On the summit of one of the Kirgiz ridges at the elevation of more than 4000 m. there is relay station "Northern". The station is located in a collapsible shack and also intermediate-station installations contain a reserve power station. The directional antennas are installed on the roof of the shack. Power supply is obtained by a special electric transmission line. On the summit of Fergan ridge at a height of 3600 m. there is radio relay station "Southern". All the installations of the "Southern" station are analogue to the installation of the relay station "Northern".

Line: FRUNZE - TALAS^{12, 13}

Length: 205 km.

SECTION 12

Line: DZHELAL - ABAD - UCHTEREK ¹²

Length: 120 km.

Line: ALMA-ATA - FRUNZE - TASHKENT

Equipment: 24-channel system (as planned in 1956). Automatic equipment was supposed to be installed in late 1958. The system has TV channels.

Length: 720 km.

Note: This line has two terminal stations in the town of Alma-Ata and Tashkent. One main station of Frunze and three high mountain relay stations at Kurday, Chan-Kur and Tyuzashu.

Line: FRUNZE - PRZHEVALSK ¹²

Equipment: 12-channel system (as of 1956)

Length: 300 km.

Note: The line has one high-mountain relay station at Taldy-Bulak.

Line: FRUNZE - SUSAMIR ¹²

Length: 120 km.

Note: The communication will take place through the relay station "Northern" of the Frunze-Osh line.

Line: OSH - KIZYL-KIYA - SULLATKA ^{12, 15}

Equipment: This line was supposed to be equipped with automatic equipment at the third quarter of 1958.

Length: 300 km.

Note: According to one source ¹² this line was supposed to go through the relay station "Southern" of the Frunze-Osh line and have the length of 400 km. In the later source ¹⁵ the line is going through Kizyl-Kiya and is only 300 km. in length, as shown on the map.

Line: SAMARKAND - TASHKENT ¹⁰

Note: This line was supposed to be ready before the end of 1960.

Line: CHELIABINSK - KUSTANAI^{16, 17} - SOKOLOVSKI³⁶

Note: This line has relay stations at Ozerny, Fedorovka, Krasnomolets, Troitsk, Uvelskiy and Yaman Zhelinka. Cost of line 30,000,000.00 Rubles. According to 1958 source this line was supposed to be completed soon. Cheliabinsk - Kustanai line is supposed to extend farther from Kustanai to Sokolovski.

Line: AKTYOBINSK - KARAGANDA - AKMOLINSK - PAVLODAR¹⁸

Note: According to the source from January 1959¹⁸ this line was supposed to be finished soon.

Line: 1. STEPNYAK - ZOLOTAYA NIVA
2. STEPNYAK - ENBEKSHILDER¹⁹

Equipment: RRS - 1

Length: 1. 83 km. 2. 50 km.

Note: These lines are not shown on the map because it was impossible to locate "Zolotaya Niva" and "Enbekshilder". The lines were built in 1957 to provide local telephone communication.

Line: 1. KZYL TU - YEL'TAYSKY
2. KZYL TU - OZERNNY
3. LENINGRADSKIY - BOSTANDYKS¹⁹

Equipment: RRS - 1

Length: 1. 58 km. 2. 67 km. 3. 47 km.

Note: Those lines are shown on the map in a very approximate position. These lines were built in 1958 to provide local telephone communication.

Line: PETROPAVLOVSK

Note: See Moskva - Vladivostok trunk line which goes through Petropavlovsk.

RADIO RELAY USED FOR TV

It is possible that most of these lines are also used for communication purposes.

SECTION 12

Existing Lines:¹⁶

TASHKENT - CHIMKENT
- KUSTANAY
- FERGANA
- SAMARKAND
- NAMANGAN
- YANGI-YER
- BEGOVAT^{6, 20}

The following TV relay stations were supposed to be ready in 1958:^{6, 20}

ANGREN
YANGI ABAD

Under construction or planned:

ANDIZHAN

Additional stations are being installed in:

TERMES
KARSHI
VRGENTH²¹
ASHKABAD - NEBID - DAG²³

The above mentioned TV relay stations are not shown on the map.

WIRE AND CABLE COMMUNICATION

Kazak SSR area is connected at present with Moscow by cable which is operating well. A new cable is linking industrial centers of Kazak and Siberia. (Fall 1958)³⁰

The number of telephones in Kazak Uzbek etc. , will be increased before 1965 by 1 1/2 to 2 times. In cities with population of 80,000 or over automatic telephone systems will be installed.³¹

In Ferganskaya Oblast the number of telephones will be increased by 400 percent. (In 1954 there were only 4 telephone exchanges).

The following ATS will be built with a total capacity of 4000 numbers:

FERGANA ATS	1500 numbers
KOKANG ATS	1500 numbers
MARGELAN ATS	600 numbers

In rayon centers 300 and 200 numbers ATS will be built. The number of interurban channels will be doubled. Fergana will have direct dialing system with Tashkent, Andizhan and Kokand.³²

Baku and Krasnovodsk are connected by the undersea cable.²³ Krasnovodsk is receiving TV programs from Baku, most probably by this cable.

In February 1959 new interurban communication facilities were put into operation on Ashkhabad - Mary line. It has now increased capacity by 100 percent. (It might be a part of radio-relay system between Ashkhabad-and-Stalinbad).

The semi automatic installation was supposed to be put on the same line in late 1959 and increase further its capacity by 20-25 percent.²⁴

In Tadzik SSR telephone communication is quite developed. In most of the cities and rayon centers there are telephone exchanges.²³

Stalinbad is supposed to have ATS already for about 10 years.⁸ Stalinbad is also connected with Moscow.

The telephone line between Stalinbad and Khorog received recently additional circuit.²⁴

During the recent 7-year-plan, 50 permanent and 20 mobile telephone exchanges will be added to present facilities in Tadrik.²⁴

Kirgiz is connected by telephone with Moskva, Tashkent, and Alma Ata and all the rayons. It also has extensive telegraph communication.⁸

Uzbek has very well developed telephone-telegraph system with center in Tashkent which is one of the largest telecommunication centers of U. S. S. R.⁸ Tashkent is connected by telephone with all the oblast and rayon centers beside communication with remaining parts of U. S. S. R.

It is planned to install a new ATS in Samarkand.²⁵

List of References.

1. Vestnik Svyazi, No. 3, 1956.
2. Radio, No. 6, 1958.

SECTION 12

3. Radio, No. 12, 1958.
4. V. S., No. 10, 1957.
5. Radio, No. 3, 1957.
6. V. S., No. 9, 1958; No. 5, 1957; No. 1, 1957.
7. Meteorologiya; i Gidrologia, No. 40 and 41, 1956.
8. V. S., No. 11, 1947.
9. Kazakhstanskaya Pravda, March 19, 1958.
10. V. S., No. 5, 1960.
11. Informatia Bucurestivli, July 25, 1956.
12. Electrosvyaz, No. 10, 1956, p. 3-80.
13. Sovetskaya Kiryizya, Jan. 3, 1959, p. 3.
14. V. S., No. 9, 1959.
15. Komsomol'skaya Pravda, Dec. 1957.
16. Kazakhstanskaya Pravda, May 7, 1958.
17. Izvestia, Jan. 18, 1958.
18. Kazakhstanskaya Pravda, Jan. 24, 1959, p. 3.
19. V. S., No. 1, 1960.
20. Pravda Vostoka, May 7, 1958.
21. Electrosviaz, No. 5, 1958.
22. Trud, Oct. 31, 1957, p. 4.
23. Turkmenskaya Iskra, March 4, 1959, p. 4.
24. Ibid, Feb. 25, 1959.
25. Pravda Vostoka, Sept. 8, 1960.
26. V. S., No. 7, 1955.
27. V. S., No. 9, 1955.
28. V. S., No. 9, 1956.
29. V. S., No. 1, 1959.
30. Literaturnaya Gazeta, Nov. 27, 1958.
31. V. S., No. 1, 1959.

32. Pravda Vostoka, Feb. 21, 1959.
33. List of Point to Point Radio Communication Channel, ITU, 1955.
34. List of International Telecommunication Union.
35. IR - 1519 - 58 Microwave Radio Relay System of the U. S. S. R.
36. Map included with IR - 1519 - 58.
37. Kropivner op. cit., p. 179 and IR - 1814 - 58, p. 11.

LIST OF AIRPORTS USED BY COMMERCIAL AIRLINES AND ADMINISTRATIVE OF NORTHERN SEA ROUTE

Aktyubinsk Akmolinsk	Kokand
Alma Ata*	Kokhetav
Ashkhabad*	Krasnovodsk
Ayaguz	Kustanay
Balkhlash	Pavlodar
Bukhara	Petropavlovsk
Chardzhou	Samarkand
Dzhambul	Sempalatinsk
Dzhusaly	Stalinbad*
Fergana	Tashkent*
Frunze*	Termez
Gur'yev	Uralsk
Karaganda	Ust'-Kamenoyorsk
Khodzheyli	

* Principal Airports

Source: Oxford Regional Economic Atlas, 1956.

SECTION 13

WESTERN SIBERIA

GENERAL

The most developed part of Western Siberia is the southern Ural mountains. Many communication facilities are existing there. New and improved automatic telephone exchanges are going to be installed in Nizhney Tagil - Sverdlovsk - Omsk - Novosibirsk - Kemerovo - Biysk - Stalinsk and Temir - Tau.¹ Salekhard has a telephone connection with Tobolsk.² (It is not stated whether wire or telephone). There is a large amount of radio communication facilities in the southern part of Novaya - Zemlya. (Despite the fact that this part belongs to Europe the list of station names and frequencies are included.)

Norilsk

Although telecommunication facilities have not been reported in Norilsk, there is no doubt that such exist, and possibly are expanding. Only recently (January, 1961) scheduled air communications were started with Moscow.³ A television broadcasting station was built in 1958. The town industry is metallurgy and mining.⁴

List of References:

1. V.S., June 1959.
2. V.S., November 1947.
3. Izvestiya, January 31, 1961.
4. Izvestiya, January 14, 1959, Pravda, January 3, 1959.

RADIO COMMUNICATION CENTERS

<u>Location</u>	<u>Administrative-Territorial Division</u>
Novosibirsk	Novosibirskaya Oblast', RSFSR
Omsk	Omskaya Oblast', RSFSR
Sverdlovsk	Sverdlovskaya Oblast', RSFSR
Chelyabinsk	Chelyabinskaya Oblast', RSFSR
Dikson Ostrov	Arctic Ocean Coast, (Source: Sovetskaya Arktika, No. 7, 1940, pp. 61-66; Geografiya v shkole, No. 3, 1946, p. 73.

RADIO RELAY LINES

Line: PERM (MOLOTOV) - SVERDLOVSK (SECTION OF MOSKVA VLADIVOSTOK LINE)¹

Note: Intermediate stations of this link are spaced 50-70 km apart with a TV channel in use. Reported in operation as a link of Moscow Khabonvsk line.²

Line: SEVEROURALSK - SEROV - KACHKANAR - SVERDLOVSK¹

Note: To be ready in 1962 and will have a TV channel.

Line: SVERDLOVSK - KURGAN

Note: This line is a television relay link and is probably part of the Transjbevan radio relay link.²

Line: CHELIABINSK - SVERDLOVSK³

Note: This line was built for railroad purposes.

Line: NOVOSIBIRSK - PROMYSHLENNAYA - BELOVO

Note: This line is being built for railroad communication.⁵

Line: PROMYSHLENNAYA - TOPKI - TAYGU¹⁵

Length: 150 km

Note: Reported as being built for railroad communications.

Line: CHELIABINSK - KUSTANIA

Note: See "Central Asia"

Line: KUIBYSHEV - UFA - CHELIABINSK

Note: See "European USSR."

Line: PERM - NOVOSIBIRSK (SECTION OF MOSKOV - VLADIVOSTOK LINE)

Note: See Perm (Molotov) - Sverdlovsk; Sverdlovsk - Kurdan; Moskov - Vladivostok (European USSR).

SECTION 13

Line: NOVOSIBIRSK -- BARNUL

Equipment: Using KRR 30/60 or K-24 multiplex equipment.

Television Relay

There is a possibility that TV relay lines may be used for communication (not shown on the map.)

Kemevovo television programs will be sent to seven relay stations in the Kuzbas area, some of them are Leninsk -- Kuznetskv Stalinsk and Anshevo -- Sudzensk. 6, 7

List of References: (Radio Relay Lines)

1. Sovetskaya Rossiya, August 20, 1960.
2. Radio, No. 5, 1959, p. 4.
3. A.T.S., No. 11, 1958, pp. 18-20.
4. V.S., No. 1, 1960.
5. A.T.S., No. 5, 1958.
6. Stroitel'naya Gazeta, May 4, 1958, p. 4.
7. Pravda, May 23, 1958, p. 6.

LINE TECHNICAL CENTERS (LTUs)

<u>Location</u>	<u>Administrative Territorial Division</u>
Anzhersk	Kemerovo Oblast RSFSR
Asha	Cheliabinsk Oblast' RSFSR
Barnaul	Altay Kray RSFSR
Kemerovo	Kemerovo Oblast' RSFSR

**LIST OF AIRPORTS USED BY COMMERCIAL AIRLINES
AND ADMINISTRATIVE OF NORTHERN SEA ROUTE**

Arctic Station on Novoya Zemla	Kolpashevo
Arctic Station on Severnaya Zemla	Krasnoyarsk*
Arctic Station on Zimovochnay- bukhta	Kvrgan
Belyy Island	Norilsk
Berezovo	Novosibirsk*
Cheliabinsk	Omsk
Chulkovo	Sverdlovsk*
Dikson	Tomsk
Dudnika	Tyumen
Igarka	
Khaty-Mansiysk	

***Principal Airports**

Source: Oxford Regional Economic Atlas, 1956.

SECTION 14

SOUTHEASTERN SIBERIA

RADIO RELAY LINES

Transsiberian radio-relay will extend through Irkutsk (See European U. S. S. R. Moscow-Vladivostok radio-relay line).

WIRE COMMUNICATION LINES

By tracing new telegraph offices it can be deducted that big building activity in the communication lines took place during the last four years.

New improvements were made on Transsiberian trunk lines. Many small lines were built east from Chita.

A new chain of telegraph offices is going from Chita to the Mongolian border from which existence of a new line can easily be deducted.

One of the most important is the existence of a new line from Yakutsk to Irkutsk. It seems to be the first wire connection from Yakutsk to Moscow.

[References: Official List of Telegraph Offices Open for International Service, I. T. U., 1951.

Annex No. 23, to above mentioned list January 1, 1960, covering 1956-1959.]

RADIO COMMUNICATION CENTERS

<u>Location</u>	<u>Administrative-Territorial Division</u>
Chita	Chitinskaya Oblast', RSFSR
Irkutsk	Irkutskaya Oblast', RSFSR

SECTION 14

LINE TECHNICAL CENTERS (LTUs)

<u>Location</u>	<u>Administrative-Territorial Division</u>
Cheremkhovo	Irkutsk Oblast' RSFSR
Irkutsk	Irkutsk Oblast' RSFSR
Skovorodino	

Source: IR-1380-58, "Communication in the Soviet Far East," and "Line Technical Centers in the U.S.S.R."

LIST OF AIRPORTS USED BY COMMERCIAL AIRLINES AND ADMINISTRATIVE OF NORTHERN SEA ROUTE

Bodaybo
Chita
Irkutsk*
Kyakhta
Mogocha
Nerchinsk
Skovovodino
Tsipikan
Tygda
Ulan-Ude
Vitim

* Principal Airports

Source: Oxford Regional Economic Atlas, 1956.

SECTION 15 EASTERN SIBERIA

GENERAL

The most important development in this area during the last four years is building two wire communication lines.

The chain of new telegraph stations show that Yakutsk is now connected with Irkutsk and the Transsiberian trunk line. In the other place there is a second chain of telegraph offices from Yakutsk to Ayan.¹

On the Northern shores of Eastern Siberia there are many Radio Communication Stations used for communication, Aeronautical and Navigational Purposes.²

List of References

1. Annex No. 23, List of Telegraph Offices, I. T. U., 1960.
2. I. T. U., Lists of Fixed Aeronautical and Shore Stations.

RADIO COMMUNICATION CENTERS

<u>Location</u>	<u>Administrative-Territorial Division</u>
Yakutsk	Yakutskaya ASSR, RSFSR
Tiksi	Arctic Ocean Coast

Source: For 1959, 1960, "Sovetskaya Arktika," No. 7, 1940, p. 61-66; Geografiya v shkoie, No. 3, 1946, p. 73.

LIST OF AIRPORTS USED BY COMMERCIAL AIRLINES AND ADMINISTRATIVE OF NORTHERN SEA ROUTE

Aldan
Tiksi

SECTION 15

Yakutsk*

Zhigansk

Zyryanka

* Principal Airports

Source: Oxford Regional Economic Atlas, 1956.

SECTION 16

EASTERN U. S. S. R.

GENERAL

Radio communications in Eastern U. S. S. R. is highly developed. Radio communication centers exist in many locations. Vladovostok and the surrounding area has many radio communication stations and it is probable that a radio communication center exists there.¹

Magadan has very few communication facilities shown but this is a highly developed area and existence of many more stations is very probable.²

Many new developments in the telecommunication field were made during the last four years in Eastern U. S. S. R.

Alongside the transsiberian railroad many new telegraph offices were open. By tracing chains of newly opened telegraph offices existence of new telegraph and possibly telephone lines can be deducted.³

Such lines exist in the following locations:

From Sovetskaya Gavan alongside the coast to Veselyy Yar (there is no material showing extension of this line to Vladivostok).

There are many new telegraph offices in Sakhalin. Yuzhno-Sakhalinsk seems to be connected by wire with Nikolayevsk.

Nikolayevsk with Khabarovsk

Nikolayevsk with Chagdamyn

Zlatoustovsk with Svobodnyy⁴

There are many new short lines west of Khabarovsk in Yevreyskaya Oblast and it is possible that some of these lines which are going to Mandzurian border are connected with Charbin (Cha-Erh-Pin).⁴

There is a new wire communication line between Magadan and Komsomolsk.⁶ It is probable that this line connects at Ayan with a new chain of telegraph offices which goes to Yakutsk.

Strategic Value

The Eastern U.S.S.R. today is characterized by three factors of strategic significance: (1) its military and geographic position; (2) its intense development as a defense and heavy industry base; and (3) its expansion as a base for Soviet military aviation and missiles. In each of these factors communications plays a vital part. In fact, in conditions peculiar to the Eastern U.S.S.R. a remote region of vast distances, rugged terrain and sparse population communication assumes a particularly strategic role.

Advanced airfield complexes and operating areas, long-range aviation units and missile bases, have been reported on the Chukotsk and Kamchatka peninsulas and Sakhalin Island, as well as numerous other points throughout the entire region. As adequate communications are absolutely essential to the effective operation of modern military forces, the rapid growth of military installations in these areas, if confirmed, implies that there must be a supporting communications network. Accordingly, information on communications facilities existing or planned in the Soviet Far East would be an important element in any intelligence estimate of Soviet military potential in this area.

Likewise, the industrialization of the Soviet Far East, especially in the heavy and war industries, is also closely linked with demands for increased communications facilities. Particularly, the requirement is for swifter more adequate and more dependable communications within and between important economic regions of the U.S.S.R. such as the Soviet Far East. In this connection, the 1957 State Plan for Development of the National Economy stressed the need for expansion of communication facilities in the Soviet Far East, the Urals and Siberia.

However, there is a marked scarcity of information on communication facilities in this strategic region. Data on certain important aspects of Soviet Far East communications are absolutely lacking at present. Yet even this lack of information may be revealing, especially when it relates to such militarily important locations as the Chukotsk area (Magadan Oblast) and the Kamchatka and Sakhalin Oblasts.

Of significance also, are the location and concentration of apparently non-military communication facilities such as radio broadcasting stations, line maintenance centers, radio centers, television stations, overhead lines, etc., because they point up the range and extent of existing communications systems. Such general facilities may, in addition, be utilized for military communications in view of the apparent low density of communications coverage in the Soviet Far East.

An interesting glimpse of the future is the indication that advanced communication techniques, utilizing "scatter" propagation systems in conjunction with microwave radio relay lines, are slated for development in the Soviet Far East. Such systems would solve a basic problem in this far-flung region, that is, supplying it with economical and reliable communication facilities.³

List of References

1. I. T. U., List of Fixed Stations.
2. Magadanski Ekonomicheskiy Reyon, Malogin A. P., 1957.
3. IR 1380-58, Communication in Soviet Far East.
4. Annex No. 23, List of Telegraph Offices, I. T. U., 1960.
5. The Mercantile Marine Atlas, Liverpool, 1959.
6. V.S., No. 7, 1960.

RADIO COMMUNICATION CENTERS

<u>Location</u>	<u>Administrative-Territorial Division</u>
Birobidzhan	Yevreyskaya AO, Khabarovskiy Kray, RSFSR
Khabarovsk	Khabarovsk Kray, RSFSR
Komsomol'sk	Komsomol'skiy Rayon, Khabarovskaya Kray, RSFSR
Yuzhno-Sakhalinsk	Sakhalinskaya Oblast', RSFSR
Anadyr	Chukotsk Peninsula*
Nikolayevsk na Amure	Far East**

* Source: "Tikhookeanskaya Zvezda" May 5, 1945, p. 3.

** Source: "V.S.", No. 12, 1945, p. 1.

[These are old sources and may be obsolete.]

SECTION 16

LINE TECHNICAL CENTERS

<u>Location</u>	<u>Administrative-Territorial Division</u>
Aleksandrovsk	Sakhalin Oblast' RSFSR
Ayan	
Birobidzhan	Khabarovsk Kray RSFSR
Iman	
Khabarovsk	Khabarovsk Kray RSFSR
Kuibyshevka	
Komsomol'sk	Khabarovsk Kray RSFSR
Magadan	
Nikolayevsk na Amure	Khabarovsk Kray RSFSR
Sovetskaya Gavan'	Khabarovsk Kray RSFSR
Vladivostok	Primorskiy Kray RSFSR
Yuzhno-Sakhalinsk	Sakhalin Oblast' RSFSR

Source: IR-1380-58, "Communication in the Soviet Far East," and "Line Technical Centers in the U. S. S. R."

LIST OF AIRPORTS USED BY COMMERCIAL AIRLINES AND ADMINISTRATIVE OF NORTHERN SEA ROUTE

Aleksandrovsk	Iman
Ambarchik	Khabarovsk*
Arctic Station in Wrangel Island	Komsomol'sk
Ayan	Magadan
Bikin	Markovo
Birobidzhan	Nikolayevsk
Ekimchan	Okha

* Principal Airports

Source: Oxford Regional Economic Atlas, 1956.

Petropavlovsk Khamtsatsky

Voroshilov

Pil'Khyn

Vladivostok

Provideniya

Yuzhno-Sakhalinsk

Uelen

APPENDIX 1
LIST OF RADIO STATIONS

APPENDIX 1
LISTINGS OF STATIONS

This appendix contains exhaustive lists of Soviet radio stations by locations, call letters and frequencies. These lists have been initially broken down by regions:

Caucasus

Central Asia

Western Siberia

Southeastern Siberia

Eastern Siberia

Eastern U. S. S. R.

Ostrov Vaygach, Polostrov Yugorskiy

In each regional breakdown, the stations have been further classified, according to the following criteria:

- 1. Fixed, or radio communication stations—below and above 27000 kc.**
- 2. Coast stations.**
- 3. Aeronautical stations.**
- 4. Special or atypical stations.**

Stations reported since 31 March 1959 are noted, and information sources are included in the various lists. Data which has relevance to Soviet polar stations is included in Table 3 at the end of this appendix.

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Adjikabul	RLNN	3500	Alazan Sovkhoz (Cont'd)	RTS9	18305
	RLNN	4880		RUX8	19405
	RW646	4984		RTS9	23385
	UBTA	13463		RTS9	25475
	RLNN	14765	Aliaty	RLMC	3840
	UBTA	22630		UBOG	16415
Agan	RRL8	24627		UZSP	17555
	RSG	7445.5		UBOG	18457.8
	RRV7	9842.6		UZSP	23130
	UCN9	14812.5		UZSP	24814
	RPT9	16220	Amasia	RLWD	3870
	UTRY	17376			
Agdach	UZ XU	25029	Anapa	RLHH	3330
	RII6	1791		RLHH	4600
	RLRR	4420		RLN7	7522.7
	RSB5	7347.6		RQS6	9482.5
	RUV7	7632.3		UBGK	18566
	RAK4	16190		UZJP	25023
Akhalkalaki	UZKV	25120		UBJ6	26482
	UVY7	26249	Apcheronskii Port	EUL	1700
				EUL	1975
				UBL1	4087
				ERP	4144
				UBL	6295
Akhaltzikhe			Armavir	REY6	1623
	RPB8	1731		RQR8	2213
	RLSA	3340		RLGP	3330
	RSD8	7712.5		RLGP	3530
	UWOU	10723		RLGP	4600
	UTWR	13917		UDM	4825
Alazan Sovkhoz	UUE5	27221		UDM	4975
	RUX8	1867		RBB5	7492.7
	RLUG	7305		RET8	9362.5
	RBS8	7422.3		UFDH	10627.3
	UFKE	11612.2		UZUV	15827.3
	UWGG	12155		UZUV	18586
	UWGG	13370		UZTS	24682
				UZFP	25357

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Artema Ostrov	UIV	1700	Baku (Cont'd)	RLOV	2770
	UIV	1975		RIP1	3320
	RIPH	2370		RLRM	3340
	UBG7	3582.5		RLMG	3595
	RLMJ	3840		RLMB	3700
	UKF4	13987		EKD	3705
	UFAX	22384		RLNY	3795
	UWEJ	26305		RIPA	3840
Artik	RLWO	2755		RLMA	3840
	RLWO	3575		RUP	3885
	UFBZ	5805.7		RRRG	3980
	RUU7	7487.6		RLNV	4020
	UFZM	10145		UFV	4035
	UTH5	13576		USE	4085
	RQD9	14375		RLMB	4134
	RQD9	15570		RLMB	4153
	UTH5	21755		RLRM	4485
	UFZM	22411		RIO60	5110
	UZVV	22585		RAI	5355
	RUU7	24310		RLOJ	5440
	UZVV	24608		RLNV	6450
Astara	UIU	1700		RIO	6850
	UIU	1975		RIP	
	ULS	4020		RRRG	6883
	RLP6	7887.5		RLMB	6920
	UZI K	24757		RRRG	6958
				RIO	7505
Azizbekov	RLWV	3870		RIO	7675
				RRRG	7755
Bachati	UZY3	4387.8		RRRG	7895
	RQL6	7332.3		UON	8280
	UZY3	7345		RIO	9840
	UZUM	11406.6		RIO	10170
	URT5	11657		RIO	10710
	UNQ6	16272.6		RRRG	10720
	UNQ6	22510		RDN23	10910
	UZUM	24405		RRRG	11035
				UON	11040
Baku	UBJ	139.45		RRRG	11130
	UBJ	320		RUP	12280
	UFV	2610		RUP	12310
				RRRG	12325
				RIO	13700

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Baku (Cont'd)	RIP	13700	Beloretchen- skaia St. (Cont'd)	UHR	4980
	RRRG	14740		RIZ9	7327.7
	RRRG	14850		UBVV	10307.6
	RRRG	14860		UZKG	10642.6
	RRRG	14890		UBVV	14265
	RRRG	14920		UZNN	14810
	RIP	15757.5		UZHQ	20650
	RIO	15762.5		UZKG	22095
	RIO	16265		UZNN	24496
	RAE	18575		UZHQ	25514
	RRRG	19475	Bermamyt Gora	UBKO	84
	RIO	22865		RLGW	4535
	RIO	23380		RUJ4	7577.6
	RRRG	26940		UZJB	24851
Baladjary	RDN	3745	Bezenghi	RLGA	3760
	RBO7	7445.5		RHG6	7452.3
	RKJ9	20325		RUG9	9488
	RTA7	22333		RLGA	14735
	RKJ	25559		RUG9	18715
Bank	RLNA	4020		UBWL	19935
	RLNA	7790		UBWL	23888
Basarghetchar	RLWF	3870	Brianskaia Kosa	UKF	4050
Batumi	RLF	1741		UKF	18935
	RAY7	1826	Charoi	RLHJ	2350
	RHF8	1897		RLHJ	21820
	RBP5	2153	Davalu	UZZT	3563
	RFV5	2573		RLWL	3610
	RPI5	2677		RDR7	8672.5
	UZK	3165		UFFT	12177
	EOZ	3625		UZRA	13119
	RLSB	3625		RIG6	19204
	EOI	3740		RSU7	19410
	RQP8	7847.6		UZXX	23428
	UMY3	14687	Djaudjikau	RLGJ	3345
Baturinskaia Verf	UBU	2565		UMH	3380
	UBU	4080		RLGO	3760
Beloretchen- skaia St.	EKE	3605			

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Ducheti	RLTC	3355	Evlakh	UBWB	56.7
	RIR8	8642.5		UFOP	96.9
	UWLT	10275		UUR	2580
	UWQQ	14526		UUR	3195
	RBC8	18170		UUR	3550
	RAG9	18732.3		UUR	4035
	UBPG	22464		RLNG	4970
	UZYI	23773		RSD9	8617.5
Eisk				RUS7	18650
	RLDO	3180	Gadrut	RLNV	4560
	RLAE	4050			
	UBIB	5302.8	Gagry	UPE4	24740
	UFWZ	16570			
	UFWZ	18430.6	Geriusi	RLWU	3870
	RFN8	18502.6			
	UZEK	19004	Ghelendjik	RBB8	2116
Elbrus Gora	UZYD	23219		RBD6	2642.5
	UWXI	28541		RLAB	3330
				RLAB	4600
	RLGU	3860		UBGD	5932.5
	RLGU	6790		UBZT	6962.5
	RLGU	9246		UKS4	14251
	RTC3	11545		UUS4	14987
Eldar Sovkhoz	RLGU	14435		UZYA	23284
	RTC3	19323		UXB6	26795
	RLUD	7305	Gheoktchai	RLRT	4385
	RHY6	8605.5		RLPK	4410
	UFAY	11637		RLNM	4560
	RSV6	12275		RDE7	8662.5
	RHY6	12605		RAF6	19770
	RAV9	18150		UBJB	22451
	RSV6	19241		UFJX	23504
	UBJE	22444		UEU5	26513
	UBJE	22555	Groznyi	RLGL	2385
	RSV	26126		RLHQ	2475
Erevan				RLHG	2800
	RLWB	3365		RLGL	3310
	RLWK	3685		UDG	3760
	RLW9	4880		RLHG	3760
	UBI6	14434		UDG	4950
	RUI4	18167.6		RLHQ	5190
	UZNP	23591			
	UTWL	26353			

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Grozni (Cont'd)	RLHQ	11155	Kafan (Cont'd)	URW5	20485
	RLHG	19245		RPF7	22660
	RLHG	20150		URW5	27071
Iardymly	RLPY	4590	Karadonly	RLRX	4385
	RMM8	9208		UFPD	5877.5
	UBQI	9955		UZYS	21985
	UUR3	15880		UFPD	22230
	RLPY	18700		UZYS	23726
	RMM8	21840		UWBC	26979
	UBQI	24162			
	UUR3	27399	Kariaghino	RLRL	4420
Iasenskaia	RLBF	4050		RLOE	4560
Ilitch Port	UBL	1700		UZMY	17315
	UBL	1975		UZMY	22825
	UBLI	14285		UZMY	23764
	UBL	14700			
Iusenghi Gora	RLGT	4535	Kazakh	RLRU	4365
	RJE7	9122.6		RLRU	7507
	REO8	9227		UJE4	13455
	UWWZ	11525			
	RLGT	14715	Keldbadjary	RLNP	4560
	REO8	20735			
	RJE7	21795	Khulo	RLSC	4625
	UWWZ	27109			
Izberbach	RLLC	3310	Kirovabad	UKQ	2835
	RLLC	4610		UKQ	3375.8
Kafan	RLWG	4610		UKQ	3380
	RPF7	8744		UWFK	3501
	RBP9	9393		RLOF	3895
	UWCK	10267		UKQ	4980
	RPP8	11440		RLOF	6940
	RTA5	11546		UWJB	7335
	UWCK	14425		RQX5	7512.5
	RTA5	15495		RQW8	8065.5
	RPF7	18585		UFXC	10662.3
	RBP9	18725		UBPE	10943
	UZEN	18910		UZBW	13583
				UWAO	14407
				UFLX	18981
				UFBO	19448
				UZIR	25156
				UZDL	25586

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Kirovabad (Cont'd)	UJE5	27467	Leninakan (Cont'd)	RBF9	12856
Kiurdamir	RLRQ	4385		RBF9	13785
	RSF24	13630		UZO3	14937
	RLRQ	22265		RHE9	20650
	RGH	24680		RHE9	21785
Kizyl Burun	RLMW	4020	Lenkoran	UBK	1700
Koban Selo	RLHF	2800		UBK	1975
	RLHF	3760		RLRJ	3210
	RLHF	5315		RHG7	8127.5
	RBX7	5867.4		UZWJ	10752
	RBX7	22320		UZWJ	23455
	UTZY	25140	Lerik	RLRK	3210
Krasnodar	RLAN	3180		RW767	4854.7
	RLAS	3605		RDD6	8176
	RLAQ	4830		RSX9	8789
	RLAS	5320		UFUI	12215
	RBJ5	9412.5		UFUI	19317
	RMB8	12077		UJG6	20145
	UZYE	18958		RSX9	20980
	UYE5	26753		UJG6	27159
Kuba	RLRN	4305	Makhatchkala	RBF8	1787
	USQ4	24880		RLLB	2000
Kutaisi	RLSK	3510		KUJ7	2813
	RLSK	3600		PLLE	3345
	RLTD	4770		UVK	3360
	UFND	5207.7		UDQ	4005
	RCK7	8168		UBSA	4117.5
	UFJQ	10772.4		UVK	4930
	UFCP	11087.5		RIQ7	8116
	UMS4	12950		RBT5	10573
	UNH5	14453		RBT	16920
	UFPS	23553		RBX8	19213
	UZD5	27083		UBGX	22872.5
Leninakan	UDS	3550	Mardakert	RLNQ	4560
	UBGJ	5357.4		RRZ9	5392.5
				UWGR	9145
				UBPY	10895
				RZP3	16975
				RZP3	20051

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Mardakert (Cont'd)	RFE7	20740	NKrestianskoe	RIL7	16395
	UBPY	23076	Selo	RIL7	22370
	UBS5	24115	(Cont'd)	UNC4	23672. 3
	RRZ9	24435			
	UBS5	27297	Ordjonikidze	URE	285
Megry	RLWP	2755		UMH	4900
	RLWP	3575		UWHP	16227. 2
	RAS5	17340		UWUR	17456
	UBON	20180		RNQ9	19393
	UBON	22704		UOE4	20391
	RAS5	23010		RNT8	22693
Mikoian Chakhar	RLGG	2755		UFQT	23138
	UZOB	3772. 5	Ordubad	UFSW	22732
	RLGG	4445	Piatigorsk	UNI6	3500
	UZOB	7495		RWF	3585
	UZPU	9935		RLHD	3760
	RTG8	19101		UNI6	3812. 6
	RTG8	19875		RLGX	3860
	UZA3	20200		RWF	4290
	UFPU	22541		UDO	4800
	UBXK	22681		RLGX	5810
	UBXK	23000		RPS5	7982. 5
	UFPU	23240		RWF	8580
	UZA3	26926		UZME	10707. 7
Mineralnye Vody	RCB	6915		UZWD	10777. 6
	RBH9	9842. 6		RWF	10780
	UXE7	16177. 2		UBIQ	11107. 6
	UFLR	22573		RRW7	13037
	UBYJ	22884		UUG6	14302
Mukhrani Svz	RLUJ	7305		RWF	18095
	UZQX	19024		UBWX	18766
	UBXD	20815		RFR	26966
	UBXD	22757	Pirtchevan	RLNO	4560
	UZQX	23710	Piraza	RSL8	1857
NKrestianskoe Selo	RLGN	2385		RLPZ	3890
	RLGN	3310		UBZY	5122. 7
	RIL7	8087. 5		RAA9	18192. 8
	UZUD	13535	Ploskogorie Berezovka	RLGV	4535

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Ploskogorie	RLD8	8052.5	Novorossiisk	RLAM	4050
Berezovka	URV6	16012.3	(Cont'd)	RLAZ	4600
(Cont'd)	UZZ6	17412		RLAY	5320
	UCQ5	20581		RQV5	5417.3
	UBWD	21824		UPM6	13934
	UZGY	25500		UXI5	14696
				UVS3	16217.6
N Piatigorsk	RLGY	4380		RTU8	19311
	RGE6	8092.5		UZNA	19512
	UFLM	22616		UWDI	26833
	UBMU	22701			
	UFLM	23960	Nukha	UKR	3505
				RLRP	4305
Nakhitchevan	RLMQ	5150		UKR	4870
	RFO8	8132.5		UKR	12745
	UYI7	24800		RCB7	17255
				UBWK	18255
Nakhitchevan	RLMQ	3780		UBWK	22622
Araks	UBZ6	13195		RCB7	22810
	RRZ7	19900		RSB7	27495
	RRZ7	22831			
			Prokhladnaia	UMF	3355
Naltchik	RLGC	3760		UMF	4770
	RLGC	4477		UBXM	5252.7
	UMZ4	13807		UBZC	10732.3
	UBSO	13885		UYM4	16162.7
	UKJ8	14677		RCH8	19192
	UBSO	19073		RTB7	19371
	RUN6	19800		UKW8	20609
	UZTP	20060		UBGM	21793
	RRN7	22917.5		UKW8	26955
	UZTP	23085			
	UMZ4	23195			
	RUN6	26523			
			Riazanskaia	RLDG	3245
Nor Baiazet	RLWJ	2830		RLDG	5010
	UZJC	8582.5		UFLZ	10142.6
	RSW6	9265		UZWV	10562.6
	UZJC	19965		UZMD	11567
				RIT9	18395.8
				UWYO	26367
Novorossiisk	RUA5	1810	Sabirabad	UUQ	2625
	RLHH	3330		UUQ	3165
	EOX	3665		UUQ	4005

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Sabirabad (Cont'd)	RLRV	4365	Sterg Kertychka (Cont'd)	UWDY UWDY	24460 26909
Saliany	UTX	2580	Sukhumi	RIH8	1753
	UTX	3180		RHR6	2271
Sara Ostrov	RLMZ	4020		RAG6	2657.5
Sotchi	RLBZ	2840		RLSZ	3355
	RLBF	3225		RLSZ	4800
	UHQ	3365		UXT7	6818
	RLBW	4050		RRJ9	10352.7
	UHQ	4780		UZWR	11462.2
Staliniri	RLSE	3245		RPT6	15920
	RTP6	5113	Tbilisi	RDK	115.3
	RUO5	7932.3		RLUR	3275
	UFEG	10447.3		RIS	3605
	UZKM	10862.2		RLSY	3685
	UFJK	12967		RLUZ	
	UYG6	13679		RWO	3745
	REG7	15990		RLST	3820
	UUV4	27386		RLUR	4415
Stavropol	RGRG	2610		RLUO	4575
	UZJS	3527.3		RLUY	4960
	UWZT	3866		RRK	4972
	RGRG	4050		RIR	5040
	RRQ7	5116.5		RGH	5102
	RRQ7	13825		RLUR	5250
	RTR9	18756		RIS	5405
	RTR9	21799		RIS	5880
	RTR9	21900		RIR	6790
	UWGP	21965		RIS78	6870
	UWGP	27043		RIS78	6875
Sterg Kertychka	RLGI	2385		RIR	7385
	RLGI	3310		RUL6	7522.7
	RAD9	3872.6		RIS	7605
	UPX4	10115		RWO	9205
	UMX3	20571		RDM	9830
	UPX4	20780		RWO	9848
	UMX3	24225		RRK	9905
				RRK	10245
				RRK	10415
				RRK	10425

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Tbilisi (Cont'd)	RRK	10430	Tertter (Cont'd)	UWSC	10507
	RRK	10465		RKV9	14310
	RRK	10595		RLRW	18860
	RIR	10955		RKV9	18907
	RRK	12080		UZZV	19121
	REO9	12253		UWSC	20245
	RRK	13460		UZZV	22210
	RIR	13570		UZLQ	22600
	RSF25	13740		UZLQ	24401
	RIS	13750	Tikhoretsk	USJ	4760
	RIS	15737.5		RET9	9166.5
	RIR	15812.5		UVV6	9325
	RRK	15890		UUP6	10105
	RRK	16015		RTD8	10237.3
	RGW	16225		USL5	11097.7
	RIS	16285		UYE4	15923
	RRK	17445		RTX7	19462
	RRK	17635		USL5	20892
	RWO	18345		UFCC	23869
	RDT2	18505		UZPB	24429
	RWO	18527.5		UVD4	27349
	RRK	18610	Tsagheri	UUQ7	3643
	RRK	19465		RTX9	13413
	RRK	19715		UBYT	14865
	RRK	20875		RUN5	15960
	RIS	22930		RDS6	16175
	URR6	26456		UFFI	18775
	RIS	26895		RDS6	19185
Tchiatura	RLTA	3230		RTX9	22195
	RLTA	14355		RUQ5	24145
Temriuk	UWC	2610		UFFI	24251
	UWC	4035		RUQ5	26132
	RLAD	4050		UBYT	27023
	RLAD	14535	Tsymlianskaia	UOZ	3380
	UWC	21895		UOZ	4860
Teghenekli	RLAT	3230		RTJ3	9236
				RTJ3	10432.6
Tertter	RPN8	2633		UZN7	15592.3
	UWC8	3577.6		UWJX	18625
	RLRW	4420		UWF7	18960

Radio Communication Stations with Frequencies up to 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Tsymlianskaia (Cont'd)	UZN7	19665	Zakataly (Cont'd)	UFCZ	23476
	RTJ3	21870		RDQ8	24040
	UWJX	22550		UWWY	26171
	UZSW	23929		UWLC	26712
	UWF7	27306	Zestafoni	RLUK	4865
Tuapse	UOP	4020		RLUK	7305
	UOP	4020		UYR4	12935
	UBVA	51874		UWSI	13560
	RLI8	9142.5	Zugdidi	UWJ7	24670
	UFLV	18297.6			
	UMX6	20702			
	UZST	24026			
	UBYE	24344			
	RQP5	26117			
Voznesenskaia	RLGR	2385			
	RLGR	3310			
	RRV8	4595			
	RRV8	5742.3			
	UZH2	11065			
	UFBN	11617.6			
	UFBN	18530			
	UZQG	19930			
	UBYY	22307			
	UBYY	23410			
	UZH2	25402			
Zakataly	UVY	3605			
	RLKO	4305			
	UVY	4900			
	RDM8	8567.5			
	UVY	9422.5			
	UWWY	13945			
	UBIN	18210.6			
	UFOU	18365.6			
	RDM8	19275			
	UZVK	19365			
	UBIN	19470			
	UWLC	20045			
	UFCZ	20270			
	UFOU	20340			
	UZWH	23293			

Radio Communication Stations with Frequencies up to 27500 kc.
(Additions)

CAUCASUS

(Additions) LOCATION	CALL LETTERS	FREQ.
Adigheni	RLSD	3705
	RUD6	7372.6
	UCE5	10835
	UZFD	14670
	UCE5	14837
	UZNW	18865
	RUD6	21845
	UZFD	24526
Adler	UMN	2640
Aksaut	RNIT	3625
	UFYB	5777.3
Ali Bairamly	RLOI	1875
	UUP	2610
	UUP	3195
	RLOI	3990
	UUP	4035
Biny Selo	UKO	4920
	UYM3	7925
	UKO	8715
	UZGZ	25339
Kurinskaya Kosa	RLMY	4020
Makharadze	RLUT	4625
Naftalan	RLMN	3840
	RLMN	4280
	UBYI	16825
	RUH9	17065
	UBYI	19332
	RUH9	20810
	RTY7	22641
	RTY7	23740
Tiulenii Ostr.	RJX7	9152.5
	UWDF	15633
	UFDE	24054
	UZFC	24335

LOCATION	CALL LETTERS	FREQ
Alekseeva Selo	UUF	3995
	UUF	4960
Baku	EOU	3985
	ENS	3990
Batumi	UVA	14.6
Makhatchkala	RCT	6310
Tbilisi	RLVH	4330
	RLSY	4550

Fixed Stations with Frequencies above 27500 kc.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Armavir	RSB57	116. 2	Leninakan (Cont'd)	RSM34	2120
Artem	RSD85	329	Lenkoran	RSA37	160. 88
Astara	RSB49	245. 8		RSM50	1857
Baku	RSC52	38. 3	Makhatchkala	RSD82	159. 5
	RSA89	297		RSK76	294. 3
	RSN70	341	Nakhitchewan	RSH59	37. 56
Batumi	RSB74	75. 3		RSG98	163. 2
	RSK53	261		RSD90	263
	RSG80	296		RSL79	2287
	RSN49	411. 7	Novorossiisk	RSJ62	160. 02
	RSL87	4620		RSJ41	325. 5
Dzulfa	RSK32	328	Ordubad	RSD92	291
Eisk	RSA27	296	Poti	RSE40	157
Erevan	RSC33	32. 75		RSB66	290. 5
	RSD34	164. 2	Samtredia	RSO32	146. 5
	RSB60	261. 5	Slavianskaia	RSO45	144
	RSA48	292	Sotchi	RSI61	262
	RSN72	376. 2		RSK59	325
Gagry	RSO72	122		RSM77	4850
	RSE25	299	Stavropol	RSJ64	160. 88
Gali	RSA88	158		RSD78	292. 5
	RSA25	324		RSO23	462
	RSO70	3425	Sukhumi	RSK83	37. 85
Kirovakan	RSJ95	158		RSA66	163. 8
	RSO82	3415		RSA26	296. 5
Krasnodar	RSK81	163. 8	Tbilisi	RSG44	35
	RSD94	231		RSH43	164. 5
Latchin	RSJ32	294. 5		RSJ24	291. 5
Leninakan	RSB76	162. 3	Tuapse	RSI46	296
	RSC32	324			

Aeronautical and Aircraft Stations

(Source: List of Aeronautical and Aircraft Stations, I. T. U. October, 1958)

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Akhalkalaki Aeradio	UUK	3495 4860	Prokhladnaia st. Aeradio (Cont'd)		6650
Alekseevka Selo Aeradio	UKP	3395	Sotchi Aeradio	UHQ	3365
	UUF	3495 3995 4960 6535 11340			4780
Armavir Aeradio	UDM	3450 4825 6650	Tikhoretsk Aeradio	USJ	3490 4760 6650
Baisun Aeradio	UKBI	3455 4960	Tsymlianskaia Aeradio	UOZ	3380 4860
Beloretschen-skaia st. Aeradio	UHR	3470 4980	Zakataly Aeradio	UVY	3470 4900
Biny Selo Aeradio	UDU	3485 4920			
Groznyi Aeradio	UDG	3370 4950 6650			
Kirovabad, Azerbaidjan-skü Aeradio	UKQ	3380 4980			
Makhatchkala Aeradio	UVK	3360 4930 6650			
Ordjonikidze Aeradio	UJW	290 310			
	UMH	3380 4900 6650			
Prokhladnaia st. Aeradio	UMF	3355 4770			

Coast Stations

Source: International Telecommunications List of Coast and Ship Stations, Coast Stations, December 1959.

CAUCASUS

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Adler Radio	UAJ ₁	2640	Baku Radio (Cont'd)	UFV	375
		4140			416
		6210			425
		6240			454
	UDT	410			500
		447			2610
		500			4035
Akhtari Radio	UWE		Baku Radio	UFV ₁	6210
		410			320
		461			375
		500			425
Anapa Radio	UZC			UON	454
		410			500
		500			4140
		522			5625
Apcheronskii Port Radio	UBI	375		YYF	6210
		425			6290
		454			8280
		500			2540
	UBII	1175		UMR	4080
		1475			4140
		1700			500
		1975			
Artema Ostrov Radio	UIV	1175	Bank Radio	RLNA	1420
		1475			1600
		1700			1648
		1975	Batumi Radio	UVA	410
Astara U. R. S. S. Radio	UIU	1175			484
		1475			500
		1700		UFA	3165
		1975			4140
Astara U. R. S. S. Radio	ULS				5540
		1420			4140
		1600			4190
		1648			5540
		4020			6470
Baku Radio	UBJ	4140	Batumi Radio	UVA ₂	8240
					410
		142			472
		86			500
		320	Elek Radio	UHF	
					410

Coast Stations

CAUCASUS

LOCATION	CALL LETTERS	FREQ
Elek Radio (Cont'd)		450 500
Gagry Radio	UBN ₂	410 461 500
Ilich Port Radio	UBL	375 425 454 500 UBL ₁ 1175 1475 1700 1975
Zhilog Ostrov Radio	YYH	1420 1600 1648 4020 4140
Lenkoran Radio	UBK	375 425 454 500 UBKI 1175 1475 1700 1975
Makhatchkala Radio	UAW	375 425 454 500
Makhatchkala Radio	UDQ	4190 5690 6465 USC 450
Novoroscisk Radio	UDN	410 429

LOCATION	CALL LETTERS	FREQ
Novoroscisk Radio (Cont'd)	UDN UFN	500 4090 4140 5685 6210 6435 UDN ₂ 410 489 500
Otchemchiri Radio	UPL	410 500 519
Poti Port Radio	UVB	410 421 500 UFC 4070 4140 5570 8370
Sotchi Radio	UZB	410 500 516
Sukhumi Radio	UFF	410 450 500
Taman Pristan Radio	UQN	410 487 500
Temriuk Port Radio	UWC	410 438 500
Tiulenii Ostrov Radio	RJN7	4110 6230
Tuapse Port Radio	UVW	410

Coast Stations

CAUCASUS

LOCATION	CALL LETTERS	FREQ
Tuapse Port Radio		472
(Cont'd)	UOP	500
		4020
		5610
		6210
		8210
Tuapse Radio	UUH	410
		435
		500
	UOP ₁	4020
		5610
		6210
		8210
<hr/>		
Special Service Stations:		
Meteorological bulletins		
Baku Radio	UBJ	416
Batumi Radio	UVA	484
Makhatchkala Radio	USC	450
Sukhumi Radio	UFF	450
Notices to navigation		
Baku Radio	UBJ	416
Batumi Radio	UVA	484
Makhat-chkala Radio	USC	450
Novorosiisk Radio	UDN	429

Fixed Stations: Frequencies to 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Abagur	RSIP	2810	Baikit (Cont'd)	UBNN	10145
	RSIP	5300		USTE	10417.3
	RSIP	8045		UZQF	11082.6
Abai	RHCZ	3625		UTVQ	17683
	RHCZ	22100		UFVP	22346
Abakan	RSBA	3210		UBTC	24646
	RSBA	4525	Balyksa	RSAX	2510
Aban	RTOC	3820	Barasinsk	UXJ	4820
	RTOC	16245		UXJ	5065
Aipolovo	RHCC	4600		RUY5	7377.5
	RNG8	5747.5		RUI5	7492.7
	RSW9	7737.3		UWFS	10162.3
	UTR4	10815		UWZ6	14272
	UFCJ	11166		UWWD	16044
	RSW9	14845		UWZ6	17422.7
	URT4	15784		UBJI	18557.8
	RNG8	20135		UIK4	20771
	UFCJ	20460		UBLQ	22314
	UZIA	20525	Barnaul	UWX	2610
	UZIA	25111		RSFF	3780
Aleksandrovskoe	RMOV	2755		UWX	4005
	RHDG	3670		UWX	16660
	RHDV	4555	Bautino	RTK6	15680
	RHDG	5200		RTK6	19657
	RUI2	7397.3	Bek Budi	RQRI	2100
	RNG9	9837.3		RQRI	5290
	UST4	10323	Berezovo	RDN9	1743.5
	UWZJ	16342.7		UEN	2540
	UKP7	20777		UVF	2595
	UZIB	24710		UTXC	3504
Amyl	RTQ5	3210		ENT	3525
				RHCW	3685
Anjerskii Rud	RSKL	3710		UYM	3995
				UVF	4070
Baikit	UCO7	4153		UEN	4110
	RTQF	4255		UOL4	4227.6
	RHW6	7789.5		UYM	4815
				RSP5	5370

Fixed Stations: Frequencies to 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Berezovo (Cont'd)	RBL6	6468	Bobrovskii Zaton (Cont'd)	UBHH	25210
	RME8	6862.5			
	RCE7	7382.5	Bogotol	RVRR	3310
	UTXC	11626		RVRR	5040
	RBL6	131147.5		RHD5	5762.3
	UZOS	25147		RSS6	7527.3
Berikul	RSIF	3210		UFAC	10796
	RSIF	4280		UTRW	11575
Biysk	RSBK	2510		UWZG	14817.5
	UBS	3165		UTYL	15767
	RSKN	3860		UZXE	19459
	UBS	4025		UZL	20799
	RSKN	8180		UFVH	25191
	UBS	18685		UZL	27120
	UBS	21835	Bogutchany	RTSD	3820
Bitchura	RVNQ	3265		RTPP	4620
	UFEL	5817.4		RHS9	7352.5
	UWVY	7395		UWTC	7405
	RSM9	7512.5		UJJ4	10977
	URY6	7925		USK5	14667
	UFOU	9807.4		UWPO	16041.2
	UZE6	10767		RTP7	22387
	UUF6	11530		UZOV	24535
	UYX6	13042.5	Chaim	RHDQ	3745
	UPG6	13679			
	UUN4	17346	Dikson Ostrov	UPV	139.45
	UFEW	18326		UPV	256
	RLV7	19196		UPV	4025
	UFSZ	23897		UPV2	4025
	UZFE	24793		UPV	6300
Bobrovskii Zaton	UBX	2595		UBRJ	6902.5
	UBX	4020		UPV	8120
	UBX	6205		RFC7	8166
	RQFS	7825.6		UPV2	8205
	UWM7	11676		UVP	12110
	UBHH	14315		RMH9	12173.5
	UWM7	16655		UPV	12550
	UBNJ	18215.7		UKX7	13634
	RCF5	24415		UKD7	14413

Fixed Stations: Frequencies to 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Dikson Ostrov (Cont'd)	RSN8	15780
Drovianoi Mys	RPG6	3842.4
	RHEV	5460
	RHEV	7425
	RBQ6	8172.6
	RBQ6	8465
	UZRD	19590
	UZRD	23485
Dudinka	RVOC	2670
	RVOC	3195
	RVOC	4005
	RYV5	4380
	RXE	7390
	RVOC	8200
	RXE	10435
	RXE	11420
Dvorets	UBW	99.55
	RSU9	3887.3
	RB17	8605.5
	RLH9	9832.4
	UFWD	10227.6
	UBZR	10653.6
	UFMI	11123
	UKX8	13803
	UPH4	17122
	RLX6	18463
	RTN3	18961
Eniseisk	RDI8	1894
	UUY6	3520.7
	RFI7	3798
	UCW	4060
	RTT8	6250
	USX	6365
	USX	14505
	RTT8	21955
Iar Sale	RSQJ	3750

LOCATION	CALL LETTERS	FREQ
Iar Sale (Cont'd)	RSQJ	19110
Igarka	UFR	4165
	RJP	4640
	RUN	5855
	UFR	8330
	UFR	8455
	RJP	9280
	RJP	10545
	RJP	11140
	RUN	11980
	RJP	13510
	RJP	15910
	RUN	16205
	RUN	17575
	UFR1	18630
	RUN	19285
Igarka Port	UFR	3180
Inia	UBGN	132.5
	RSKK	3860
	RVJM	4110
	RTC4	5342.6
	RAG8	9864
	UZYT	18984
	UZFA	19795
	UKR4	20482
	UOO3	20679
	UZEI	23617.5
	UZFA	25220
Is Posiolok	RSSS	2760
	RSSS	3850
	RSSS	14275
	RSSS	16090
	RSSS	21880
Iujno Enisseiskii Rk	RTTG	2510
	RTTG	4420
	RTTG	6250
	RTTG	14455

Fixed Stations: Frequencies to 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Ivdel	RSQA	14605	Kamen na Obi	UZAZ	23389
Izvestia Vzik	RGRT	2775	Kamyninskii Ost.	RND7	5237.5
Jelania Mys	UBA	285		UFYW	5927.3
	RQM8	1734.2		UWDX	15649
	RBE9	2092		UWDX	20690
	RLQ9	2325		RND7	20970
	RPD5	3221	Kansk	UUE	3500
	RST6	3231.4		UUE	4900
	RUG7	3309.7	Karatunka	UKE	4010
	URAI	4025		UKE	16435
	URA	8330	Karaul	RVOJ	2230
	RCN9	12282.5	Kargasok	UVC	2610
	UYX3	13399		RHDD	2800
	UOE5	13967		UVC	4035
	URX6	14847		UVC	12560
Kamali	RHP5	2237	Kargo	RTTE	6245
	RVMJ	3350	Kargo Krasno Iarskii	RTTE	3750
	RTM7	5212.5	Kellog	RVOS	3245
	UBNH	5347.5	Kenga	RSLQ	3705
	RTM7	12510	Kemerovo	UZX	4755
	UFOI	16915		UGU4	12965
	UFOI	18422.6		RFY	24630
	UBNH	18770	Khalmersede	UNH	2540
	UFWM	19375		UNH	3825
	UFWM	23494		RHEZ	3890
	RTM7	24790		ERF	4110
Kamen na Obi	UTRH	1878		RHEZ	23455
	UBP	2640	Kharampiur Iaga	RHFX	4215
	RSAC	3995		RHFX	6285
	UBP	4005			
	RIR9	8722.5			
	RDG7	9477.5			
	UOA5	14346			
	UWZB	15706			
	RUN8	16190			
	USC5	17134			
	RFO6	18150			
	UBJF	18531			
	UCX8	20666			

Fixed Stations: Frequencies to 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Kharampiur Iaga (Cont'd)	UWFI	25170
Khatanga	RTPK	2755
	RTPK	4600
	UVH5	23570
Klimino	RTPL	4360
Kolpachevo	UBQ	2540
	UBQ	4080
	RSKR	4525
	RHDI	5140
Komsomolskoi Pravoy	UFXR	5292.5
	UWA	6340
	RBI6	9422.5
	RFO	10267
	UYL7	11117
	RTO5	11587
	USO7	14853
Kondinskoe	RSPT	5800
Korliki	RSPC	2350
Krasnaia Bachk Ira	RSWE	3210
Krasnoyarsk	RTTI	2510
	UDH	2580
	RVOA	2670
	UVU	2810
	RTTI	3240
	RVQE	3820
	RVRZ	3895
	UDH	4190
	RCU	4385
	RTTI	
	RVRZ	4570
	RDQ	4770
	RWD	4980
	UVU	4980

LOCATION	CALL LETTERS	FREQ
Krasnoyarsk (Cont'd)	RCU	5150
	RFH	5150
	RVOA	6210
	RVOA	6285
	UDH	6285
	RMX8	6857
	RCU	7435
	RFH	7435
	RDQ	7870
	RCU	7700
	RFH	7700
	RFH	7980
	RCU	8119
	RFH	8154
	RVOA	8400
	UDH	8400
	RGK	9470
	RLC	10260
	RDQ	10650
	RDQ	10760
	RVOA	11135
	UDH	11135
	UKK7	13867
	RCU	14490
	RFH	14490
	RFH	14752.5
	RCU	14872.5
	RCU	15480
	RFH	15460
	RDQ	15720
	RCU	16390
	RDQ	17270
	UVJ5	17437.8
	RLC	17452.5
	RNL8	18127.3
	RFH	19872.5
	RDQ	20905
	RLC	26625
Krasnosel- kupsk	RTSV	2295
	RTSV	3290
	UCG	4617.4
	RHO6	7842.5

Fixed Stations: Frequencies to 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Krasnosel-kupsk (Cont'd)	UFCT	10412.4	Leskin Mys (Cont'd)	RFT8	5026
	UGP6	14473		RAP5	6227.5
	RHO6	17485		UGM	6230
	UFYG	19460		RUW8	6313
	RTSV	19910		RPM5	6332.5
	UGP6	20055		RBU6	9848
	UFYG	23366		UBNL	9946
	UFCT	24190		UNL6	10806
Krasnoufimsk	UCG	24450		UME4	14894
	UMK	3395		RES8	16290
	RSPW	4345	Marre Sale	UCKI	4195
	UMK	4800		UCK	8395
	UFVM	5282.5		UCK	24395
	UFSU	5877.5	Matotchkin Chan	UFQE	23
	RMT9	6897.5		UFU	3170
	UFNC	10262.2		UFUI	4140
	RTQ5	10793		RUF5	4811
	UZD3	14464		RIZ5	4852.2
	UBE7	17462.4		RAU8	4887
	UFMK	19281		RAU8	5021
Kuchva	RSTO	4505		RAU8	8127.5
	USL7	25050		UFU	8300
Kuraghino	RSGQ	3210		UWCL	10557
	RSGQ	4525		UMO5	13817.5
	RSGQ	10925	Medvejii Mys	UQO	4050
Kurgan	UYO	3365			
	RQQ6	9494	Minusinsk	RSDG	3715
	UFTF	10357		UDX	6305
	UYQ5	15956		UJW6	24720
	UYQ5	20030	Mundybach	RSAF	4520
	UZCI	20070.6		RSAF	14965
	UFTF	20960	N. Port	RHD6	2086
	UZCI	22140		UDY	2540
	UZCI	25545		RBV	2617
Leskin Mys	UZCI	26220		RLU8	2647.5
	UZRS	3542.3		RCV7	2817.5
	UKP8	4197		UDY	3245
	RSO7	4824			

Fixed Stations: Frequencies to 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
N. Port (Cont'd)	RAX9	3400	Novosibirsk	RSIJ	3180
	UDY	4110		UKC	3195
	UPYI	4120		RDT	3590
	RUR9	4784		RHIE	3610
	RUE5	4906		RDT	3625
	RMZ8	6886		RSKP	3890
	UPY	8355		UXH	3995
	UWVU	10657		UKC	4010
	RJY8	13126		UUX	4020
	UKC7	14706		RCJ	4320
	UTYR	17556		RSDP	4430
Napalkovo	RSQQ	2435		RSFC	4500
	RSQQ	4505		EUE	4525
	RSQQ	6270		RTA	4570
	UPI4	8645		UXH	4790
	UOJ5	13703		RSIC	5010
	UMR6	14430		RDT	5150
	RTN8	22947		RCK	5295
Napas	RSKY	3570		RUM	5390
	UTRC	3652. 5		REI	5450
	RJR8	6483		RGB31	5475
	UWOE	10783		RRRQ	5765
	UZET	10927		REL	5795
	UZMN	11423		RCJ	5807. 5
	UBHE	13026		RTA24	5870
	UCT9	14677		RSIJ	6405
	UWYB	16247		UXH	6510
	UWSZ	17632. 4		RES7	6787. 5
	UMP6	20519		RRRQ	6818
	UFNB	22541		RRRQ	8840
	UBPA	22917. 5		RXD	6870
	UWMI	26706		RTB	7305
	UMP6	26825		RRRQ	7407
Narykary	RSOY	2490		RRRQ	7427. 5
	RSOY	4395		RDT	7435
	UBQR	5397. 7		RRRQ	7480
	UBQR	12810		RRRQ	7490
	UWXZ	15867. 8		RXD	7570
Nori	RSTT	2755		RDT	7595
				RDT	7700
				RRRQ	7875
				RSIJ	8225
				RCJ	8580

WESTERN SIBERIA

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Novosibirsk (Cont'd)	RCU73	9060
	RTA	9089
	RRRQ	9220
	RCU75	9325
	RTA	9325
	RAR	9440
	RCK	9795
	RRRQ	9957.5
	RLD9	10112.3
	RRI	10115
	RRRQ	10165
	RFX8	10339
	RTA27	10455
	RPS7	10503
	RFK5	10597
	RTA	10635
	RTB	10775
	RRRQ	10780
	RUM	10780
	RFQ7	10872.3
	RCU77	10950
	RCU78	11410
	RXD	11510
	RCK	11691
	REQ5	12073
	RXD	12100
	ERC	12180
	RAR	13017.5
	UXH	13100
	RRI	13378
	RTA	13482
	RCK72	13500
	RRI	13760
	ULL	13887
	RRI	13982.5
	RRI	14482.5
	RDT	14490
	RFW	14513
	REL	14650
	RDT	14682.5
	RTB	14760
	TDT	15460
	RRI	16130

LOCATION	CALL LETTERS	FREQ
Novosibirsk (Cont'd)	UZHT	16212
	RRI	16297
	UXH	16940
	RXD	17395
	RRI	18975
	RDT	20305
	RDT	20515
	RUM	22770
	RDT	22925
	RXD	24110
	RXD	26960
Ongudai	RSIW	4315
Paniflov	RLA9	9417.7
Parabel	RSAQ	3280
Pitskii Gorodok	RTTC	2510
	RTTC	4420
Podkamennaia Tunguska	RVNX	2670
	RVNX	3170
	RTPY	5035
	RVNX	6420
Prokopyevsk	UXI	3510
	RSIN	3710
	UXI	4825
Promychle- nnaia	RSOK	3310
	RSOK	5040
Rudolf Ostrov	RHH7	1871
	RCZ8	2330
	RQW5	2344
	UYS7	3183
	UFUCU	4761
	ENL	8340
	UYA7	10115
	URD6	10692.6
	UXK4	14923

Fixed Stations: Frequencies to 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Salekhard	URK	2610	Stalinsk (Cont'd)	RLSR	3245
	URK	3505		RSC	3810
	RSQK	3635		RNGJ	4420
	ROH	3860		RSB	5375
	UYL	3995		RSC	7620
	URK	4080		RSC	7970
	UVE	4155		RSB	10750
	UYL	4940		RSB	13170
	RSQK	5010		RSB	13490
	ROH	5095	Surgut	UEI	2610
	ROH	5180		RHDM	2800
	ROH	5277		UEI	4080
	RDY	9310		UZEX	9857.6
	ROH	10150		UZEX	10906
	ROH	10380		UZEX	15905
	ROH	10625		UYH6	16122.2
	ROH	17527.5		UYH6	22290
Samarovo	UEJ	2610		RTP5	23725
	UVG	3195	Sverdlovsk	RHX	100.95
	RLM	3565		RHX	104.45
	RLM	3580		RAW	112
	RHDT	3790		RAW	121.25
	UYK	3995		UYJ	126
	UEJ	4080		RSNU	2150
	UVG	4110		RQR5	2721
	RLM	4290		RRJ	2760
	UYK	4925		RSNU	3205
	RSOQ	5925		RSTD	3240
	RLM	5930		RLE	3790
	RLM	8580		RLE	3850
	RLM	10790		UTJ	4880
	RLM	18115		RBY	4930
Satyga	RSOT	2460		RSTD	5080
				RSN	5415
Se Iago	RSQM	2225		RNV	5420
	RSQM	4505		RRRZ	5892.5
Serov	RSQB	4345		RJL8	6827.3
	RSRC	21875		RMO8	6877.5
Stalinsk				RRJ	7340
	RNQJ	2510		RIJ8	7532.5
				RIY	7580

Fixed Stations: Frequencies to 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Sverdlovsk (Cont'd)	RFY8	7867.5	Taimyr (Cont'd)	UWLM	10627.3
	RIY	7905		UUA5	11113
	RBY	9860		RAU9	12057
	RRJ	9865		UWHE	13670
	UFQA	10182.2		UOT4	13947
	RRJ	10275		UMV5	14947
	RSN	10840	Tara	UTT	3165
	RRRZ	10855		UTT	4110
	ROI	10970		RHEQ	4525
	RRJ	10975		RHEQ	15705
	RRRZ	11610	Tarko Sale	RSQO	2300
	RRRZ	11620		RSQO	2845
	RRRZ	11660		UCI7	4097.4
	RRRZ	11690		RSQO	4505
	ROI	12270		UBGV	6497
	RRRZ	13405		RPU5	8802.5
	RSN	13520		UYH5	9295
	ROI	13558		UFSM	10475.2
	RRJ	14770		UZCC	10802.7
	RIY	14973		UZSM	11556
	RRRZ	15750		REY8	12233
	RSN	15877.5		USY5	15566
	RRRZ	16165		UUL5	17286
	RRJ	16302.5		UZNB	23938
	RRJ	16420	Chelyabinsk	RSNW	2820
	RPQ6	18183		RSMR	3365
	RRJ	18240		RFC9	3897.6
	ROI	18550		RSNW	4390
	RSN	19877.5		RSTB	4390
	ROI	20535		UZCQ	11048
	ROI	23610		RNV7	11067
	ROI	26615		UBGS	11127.7
	RSN	26730		RDV9	18103
				UFEO	24131
Taimyr	RPH5	2787.5	Tcheliuskin Mys	UIX	146.1
	UCR7	3722.5		UIX	385
	UKS7	4082.9		RQV9	2375
	UCK5	4147		UBLG	3400
	UBRH	5072.8		UMS5	3707.6
	RTOQ	6320			
	USQ7	9155			
	UYF3	9295			
	UWYW	10344			

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Tcheliuskin	UKU8	4502.4	Tobolsk	UVD	3180
Mys	RJS7	9266	(Cont'd)	RSL	3700
(Cont'd)	UZQS	10455		UPH	3995
	UVO7	11105		UPL	3995
	UAY	11120		UPH	4005
	UIX	11120		URM	4050
	UAY	12540		UWU	4065
	UWUE	14587		RSL	4425
				RSL	4580
Teguldet	RSEO	3760		UPH	5950
				UPH	6225
Tyumen	RDJ9	1762		UPH	6225
	RUH5	2288.5		RIS8	6342.5
	UVZ	2565		RSL	7375
	UGC	2610		RSL	7960
	RVNZ	2640		URM	8315
	RWM	3880		UPH	8510
	RVNZ	3995		RSL	9160
	UVI	4035		RSL	9962.5
	UGC	4080		RII5	10126
	RSNY	4525		UBKJ	10427.3
	RVNZ	4830		UFWE	10467.3
	RWM	5740		UBKY	10747
	REV6	6423		UZMQ	10987.6
	RJI7	6777		RNB7	11057
	RID6	7947.3		UPH	11100
	RPK7	8002.6		UPH	12490
	RVNZ	8215		UOJ4	13826
	UZAY	11503.3		UYA6	14897
	RTM5	11996		UZR6	17403.6
	RTC8	12226			
	UWMY	15916	Tolka	UBRD	6927.2
	RBW9	18117.5		UWGZ	9155
	RWM	18252.5		UFSD	10392.7
	RWM	19225		UZTN	10913
	UBPR	24287		UWLB	15627.2
				UYW6	17476
Tobolsk	RQN6	1806		UCE6	20144
	RPZ5	2213		UZUK	24151
	RIF7	2543		UCE6	26405
	UWU	2565			
	UVD	2640	Tomsei	RSQP	2150
	RHJ7	2741		RSQP	4505

Fixed Stations: Frequencies to 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Tomsei	UBHO	4642.4	Turukhansk (Cont'd)	RSE7	6306
	RSAG	5040		RVNY	6375
	RQA5	6352		UBNW	6983
	RGH9	9192.5		RTVL	10260
	RTU6	10762.3		RTVM	
	UFWA	11054		RFP9	12243
	UEW6	13837		RUC8	14526
	UJB4	15583		UWD6	16262.6
	UWOW	15944			
	UEK6	17523	Ust Eniseisk	RPZ9	4804
Toms	UUY	2625		RTI5	5077.8
	UUY	4065		UFWI	6330
	RSLK	4380		RPZ9	6997.5
	RSFI	4410		UFW	8340
	RSKV	5360		UWZD	10245
	UWZ	14525		UTYW	10397
	RSKV	15875		RLQ	10843
				UYF6	14580
Troitsk	UOD4	3975	Ust Taimyra	UQK	4040
	RJF8	9197.5			
	RJF8	14795	Votchanka	RTUT	2230
	UZU6	22115		UKY4	4219
	UZU6	26488		RDL8	7374.6
Tura	RSA	5770		RUM6	8027.5
	RSA	11540		RTQJ	9395
	RSA	13072.5		UBRU	9867
	RTOZ	15465		RTUT	12290
	RTQZ	19350		UFIR	13576
	RSA	23810		IKY4	19870
Turukhansk	RAP6	2253		RSA8	24385
	RAH6	2380	Vurnary	UMI	3505
	RVNY	2670		RLY6	7387.5
	RQJ9	2746		UBKT	10247.7
	RTPT	3205		UFKU	10272.4
	RPE8	3316.6		RRB9	10442.4
	RTVM	3750		UFWU	10672.7
	RVNY	4050		UZDZ	10932.6
	RTPT	5085		UZIR	11537
	RTVL	5130		UMI	12785
	RTVM			UXH4	13675

WESTERN SIBERIA

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Vurnary (Cont'd)	UZDZ	16750	(Reported since 3/59)		
	UFWU	16765	Dikson	UPV	98
	UBKT	18515	Ostrov		
	U'ZTR	20115	Galtchika	UQM	4015
	UFKU	20425	Gydo	RHEW	8250
	RLY6	22535	Iama		
	UBKT	22680	Khalmer- sede	RHEZ	8060
	UUQ6	24835	Krasnoiarsk	UKR	7325
Vykhodnoi Mys	RPN6	7997.5	Matotchkin Char	UFOE	18.1
	UTVS	10295		EMT2	79.8
	UZZX	11647	Rudolfa	EVA	4090
	UPZ6	14763	Ostrov	ENL	8340
	RPN6	16430	Tcheliuskin	EUA3	44.3
	UPZ6	23310	Mys	EUR3	79.8
Zemlia Frantsa Iosifa	UFFZ	101.3	Zemlia	EVT3	45.2
	UPX	360	Frantsa	EVT3	137.3
	UPX	4005	Iosifa		
	RBD5	4838			
	RCL9	5036.7			
	UFZE	5867.4			
	UPX	8215			
	UZJY	9953			
	UWGH	10613			
	UWPA	11137.2			
	RBA5	12033			
	UKE5	13710			
	UEO5	14486			
	UYK7	24760			
Zlatoust	RSTW	4390			
	RSTW	19750			
	UNE6	24620			
Znamenityi	RSIG	3210			
	RSIG	4280			
	UZQ3	12975			
	UWU6	13680			
	RSIG	19265			

Fixed Stations: Frequencies above 27500 kc.

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Biisk	RSC97	412.7	(Reported since 3/59)		
Dikson	RSI70	323.5	Dikson	EMX	46.3
Ostrov	RSO63	463.2	Ostrov	EMX	46.4
Gurievsk	RSL38	130		EMX	46.5
Kemerovo	RSD64	222.8		EMX	56.75
	RSG72	427.8		EMX	56.9
Krasnoiarsk	RSG88	32.2		EMX	57
	RSA31	160.02	Dudinka	EWS	40.2
	RSI71	239.6		EWS	40.4
Kyzyl	RSA96	229.65		EWS	46.55
	RSH44	297.5		EWS	46.9
	RSH70	1023.4	Krasnoiarsk	ENY	38.9
Minusinsk	RSJ58	1004.25		ENY	43.4
Novosibirsk	RSA63	31.75	Sverdlovsk	EKY	38.7
	RSC26	156.7		EKY	43.8
	RSN34	2620			
Omsk	RSK97	293.5			
Prokopivsk	RSO50	118.5			
Salekhard	RSG87	159			
	RSB95	162.3			
	RSJ76	219			
	RSH63	263			
	RSO44	2027			
Stalinsk	RSI43	250.2			
Sverdlovsk	RSK78	31.75			
	RSD63	164.7			

Aeronautical and Aircraft Stations

(Source: List of Aeronautical and Aircraft Stations, I. T. U. October, 1958)

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Barabinsk Aeradio	UXJ	3495 4820 6650	Komsomolskoi Pravdy Ostrova Aeradio	UWA UWA1	485 500 3130 4140 5600 6210 6340
Belyi Ostrov Aeradio	UCB	385 500	Krasnoiarsk Aeradio RVOA	RVOA	2670 4140 5575 6210 6285 8400 11135
Berezovo Aeradio	UYM	3445 3995 4815 6595	Krasnoiarsk Aeradio UVU	UVU	3495 4980 6650
Jelania Mys Aeradio	URA URA1	430 500 3100 4025 4140 5505 6210 6475 8330	Krasnufimsk Aeradio	UMK	3395 4800
Jelania Mys Aeradio	UBA	285	Marre-Sale Aeradio	UCK UCK1	460 500 3130 4140 4195 5585 6210 6435 8315
Kalmykovo Aeradio	UYC	3355 4860	Matotchkin Char Aeradio	UFU UFU1	465 500 3135 4040 4140 5530 6165 6210 8360
Karmakuli Aeradio	UQL UQL1	375 425 454 500 540 3140 4075 4140 5590 6210			
Kemerovo Aeradio	UZX	3490 4755 6650			

Aeronautical and Aircraft Stations

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Novaia Zemlia	UIL	450	Sverdlovsk	UYJ	3495
Russkaia		500	Aeradio		4880
Gavan		4120			6625
Aeradio		4140			11270
		5585			
		6210			
		8260			
Novosibirsk	UXH	3995	Tcheliuskina	UAY	4155
Aeradio		4790	Mys		5560
		6510			6265
		11330			8290
		13100			11120
		16940			12540
				UDF	16840
					290
Novyi Port	UPY	485	Tcheliuskina	UIX	385
Aeradio		500	Mys		500
	UPY1	3150	Aeradio	UIX1	3150
		4120			4155
		4140			5560
		5605			6265
		6210			8290
		6370			11120
		8355			12540
					16840
Petropavlovsk,	UVM	3995	Tonolsk	UPH	3995
Karagandinskii		4840	Aeradio		4005
Aeradio					5550
					6225
Prokopievsk	UXI	3430			8510
Aeradio		4825			12490
		6650			3995
					4005
Salekhard	UYL	3425			5550
Aeradio		3995			6225
		4940			8510
		6670			
Samarovo	UYK	3465	Ust-Eniseisk	UFW	420
Aeradio		3995	Port		500
		4925	Aeradio	UFW1	3140
		6650			4140
					5630
					6210
					7330

Aeronautical and Aircraft Stations

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Ust-Eniseisk		6330
Port Aeradio (Cont'd)		8340
Zemlia	UPX	360
Frantsa		500
Iosifa	UPX1	3110
Aeradio		4005
		4140
		5520
		6210
		6220
		8215
Station transmitting time signal at 0000, 0200, 0500, 1200, 1400, 1600, 2200 GMT		
Irkutsk	RST	5280
		6780
		10900
		13900

Coast Stations

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Belyi Ostrov Radio	UCB	385	Igarka Port Radio (Cont'd)	UFR ₁	6435
		500			8880
	UCB ₁	4090			11200
		4140	Jelania Mys Radio (Mys Zhelaniya)	UBA	285
		6195			430
		6210		URA ₁	500
		8385			3100
Dikson Ostrov Radio	UPV	375			4025
		425			4140
		454			5505
		500			6210
		142			6475
		86			8330
		256	Karmakuli Radio	UQL	375
		454			425
		500			454
	UPV ₁	4025		UQL ₁	500
		4360			540
		6300			3140
		8720			4075
		11220			4140
		12110			5590
		12550			6210
		17050	Khalmersede Radio	UNH	3825
	UPV ₂	3115			
		4025			
		4140			
		5600			
		6210	Komsomolskhi Pravdy Ostrova Radio	UWA	485
		6300			500
		8205		UWA ₁	3130
Iambung Radio	RSQN	2375			4140
		2795			5600
		4505			6210
Iarsall Radio	RSQJ	3750	Krasnoyarsk Radio	UDH	6340
Igarka Port Radio	UFR ₁	4140			2580
		4165			4140
		5575			4190
		6210			5575
					6210
					6285

Coast Stations

WESTERN SIBERIA

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Krasnoyarsk Radio (Cont'd)	URT	8400 11135 4170 5610 12200	Novaia Zemlia Russkia Ga- van Radio (Cont'd)	UIL ₁	4120 4140 5585 6210 8260
Leskin Mys Radio	UGM	392 425 454 500	Novyi Port Radio	UPY	485 500
	UGM ₁	3110 3140 5600 6210 6230		UPY ₁	3150 4120 4140 5605 6210 6370 8355
Marre-Sale Radio	UCK	460 500		RSPD	3250 5070
	UCK ₁	3130 4140 4195 5585 6210 6435 8351	Olovlanyi Mys Radio	UIY	415 500
				UIY ₁	3165 4140 5645 6210 6420
Matotchkin Char Radio	UFU	465 500	Se-Iago Radio	RSQM	2225 2895 4505
	UFU ₁	3170 4110 4140 5650 6210 6400 8300	Sterlegova Mys Radio	UGO	420 425 454 500
Napalkovo Radio	RSQQ	2435 2995 4505		UGO ₁	4030 4140 5670 6210 6300
Novaia Zemlia Russkia Ga- van Radio	UIL	450 500	Stalbovoi Mys Radio	UJP	385 425 454

Coast Stations

LOCATION	CALL LETTERS	FREQ
Stalbovoi Mys Radio (Cont'd)	UJP	500
Tarko-Sale Radio	RSQO	2300 2845 4505
Cheluskin Mys Radio	UAY	4155 5560 6225 8290 11120 12540 16840
	UDF	290 300
	UIX	142 86 146 385 500
	UIX ₁	3150 4155 5560 6265 8290 11120 12540 16840
Chernaia Bukhta Radio	UGT	340 425 454 500 2560 4140 5685 6210
	UGT ₁	6455
Tombei Radio	RSQP	2150 2945 4505

WESTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Uednenia Ostrov Radio	UGV	425 454 470 500
	UGV ₁	3090 4070 4140 5675 6210 6450 8260
Ust-Eniseisk Port Radio	UFW	420 500
	UFW ₁	3140 4140 5630 6210 6330 8340
Vykhodnoy Mys Radio	UHT	425 454 500 520
Zemlia Frantsa Iosifa Radio	UPX	360 500
	UPX ₁	3110 4005 4140 5520 6210 6220 8215

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Achkhabad	ROEX	2415	Akkul	UZUE	19686
	UGG	3365		UZHB	25302
	ROGA	3620	Akmolinsk	RNSM	2755
	ROFC	4280		RQE7	3400
	ROFF	4350		RNRI	3765
	ROEH	4560		RNSQ	4092
	UGG	4840		RNSM	4320
	RUJ	5280		RNSQ	4320
	RGA8	6906		UNJ	4790
	RFX7	7652.3		RNSQ	5100
	RFQ	7845		RNSQ	5820
	RFQ	7930		RQE7	6832
	RFQ	7945		RDS9	7762.5
	RFQ	8110		UFQP	11153.6
	ROFC	8560		UFIG	11563
	RFQ	9360		UUO7	14943
	RAH8	9846		UFAW	18202.6
	RUJ	10560		UWZN	26261
	RFQ	10705	Akzabskii	RIG8	7717.5
	ULU	13906		RMO7	9322.5
	RFQ	14780		UZXR	10397.2
	RNI	14860		UZXR	24480
	RUJ	17542		UFBD	25147
	RTA6	18106		RIG8	25195
	UZI	25201	Aktchi	ROAG	4220
	RFQ	26885		ROAG	4520
Aiaguz	RAU	3500		ROAG	7305
	RNGS	3850	Aktiubinsk	REQ	2655
	RNEH	4795		EKX	3300
	RDU	5070		EKX	3815
Ak Mula	UFK	3995		RNAK	4420
	UFK	4980		EKY	4755
Akdjal	RNJJ	3255		RNAJ	5025
	RNJJ	5040		REQ	5435
Akkul	UBJP	74.2		RSA8	6468
	RNQQ	2510		RJC8	9317.5
	RNQQ	4420		RPC7	9472.5
	UBNZ	6867		RNZ7	10222.2
	RIB6	7477.5		UFXX	10553
	UOD3	14803		REQ	10870

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ
Aktiubinsk (Cont'd)	UBLK	11173
	UFPV	11447.4
	REQ	12145
	UGT6	13993
	UXY5	14552.5
	REQ	17195
	UFTM	18242.6
	REQ	26870
Aktogai	RNIN	3700
Alekseevka	RNIR	3255
	UKP	3395
	RNIR	3620
	RNIR	5040
	RHV9	7567.5
	UTRP	11590
	RCA7	15625
Algazy	RKI9	16.1
	RNFM	2565
	RNFM	4020
	RPB6	7817.7
	RNZ9	10482.6
	UZLG	11027.6
	RPR9	15630
	UWVT	16107
	RNZ9	18336
	UFTO	18563
	UFLA	19478
Alma Ata	RDR	3550
	RRRB	3650
	RDR	3885
	REB	3885
	UMX	3995
	UNX	
	RBX	4330
	RRRB	4480
	RCW	4625
	UMX	4830
	UAO	4840
	REW	4915

LOCATION	CALL LETTERS	FREQ
Alma Ata (Cont'd)	RRRB	4957.5
	RNFI	5200
	RDR	5260
	REB	5260
	RCW74	5305
	RCW	5395
	RRRB	5882
	RDR	5905
	REW	5925
	RRRB	6970
	REW	6980
	RRRB	7357.5
	RRRB	7460
	RAK	7462
	RDR	7660
	RFH6	7742.3
	RAW8	7712.6
	RRRB	7855
	RCW79	7910
	RWJ	7910
	RDR	8000
	RBX	8660
	RRRB	9100
	RRRB	9150
	RWH73	9250
	RRRB	9300
	RRRB	9430
	RRRB	9915
	REE	9920
	RRRB	10210
	RWJ	10375
	RDR	10395
	RDR	10525
	RRRB	10585
	RWJ	10610
	REW	10665
	RCW	10790
	RBX	10940
	RGV	12170
	RAK	12205
	RDT72	12205
	RDR	13167.5

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Alma Ata (Cont'd)	RTD	13370	Amga (Cont'd)	UZHR	24747
	RRRB	13390			
	RRRB	13420	Andijan	ROJU	2775
	RGV	13628		ROID	3995
	RDR	13840		ROJU	4445
	RRRB	13880		ROIH	4535
	UBZ7	13947		RQIO	5450
	RDR	14457.5		RHL5	7647.3
	RLP9	14612.5		UZIL	9946
	RAK	15717.5		UWSP	14809
	REB27	15820		UZCM	19801
	RPY9	15980		UZJL	25173
	RWJ	16037.5		UZCM	25240
	RGV	16240		UBYM	26609
	RAK	16720		UZF4	26769
	RDR	16145	Angren	ROAE	4495
	REB	18207.5		ROAE	5170
	UFYU	18270.8	Aralsk	REZ9	2553.5
	REB	18315		RCO8	2797
	RRRB	18885		RNAD	4115
	RWJ	19675		RNAD	6335
	RDR	23680		RQK5	7747.5
Altyn Mazar	UOU4	4160		UFYN	13604
	ROME	5750		UZE4	14797
	RAS4	7397.5		RTR6	18232.8
	RAS4	7802.3		UZJZ	25210
	UWTK	16137.2		UUO3	26414
	UFZA	18746	Aralskoe More	UWVD	3680
	UIZ	20832		RNAH	4020
	UFZV	22404		UFCI	5787.7
	UJI4	26580		RDC6	7782.5
	UIZ	27205		UWVD	8470
Amga	RUF4	1623		RNAH	11080
	RTWU	2510		RNAH	16410
	RTWU	4100		RNAH	20165
	RQF8	7517.5		UZCV	20465
	UWGM	10173		UZCV	24544
	RHR	13562	Aryk Balyk	RNSR	2840
	UYG3	16113			
	UWDM	17643			
	UFRN	22358			

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Aryk Balik (Cont'd)	UYV4	3509.6	Baladjal Rk	RNIQ	3255
	RNSR	4350		RNIQ	5040
	RCO7	7687.5		RNIQ	14255
	RCO7	20015	Bamnak	RTKY	7700
	UZKF	25550		UWVN	10138
	RME	26429		UBII	20260
Ata Su	UZAF	3807.4		UWVN	21770
	RNQE	5455		UFSO	21825
	RBC7	7997.5		RTKY	23710
	RBC7	17655		UBII	24553
	UZRM	23907		UZFN	25541
Atbasar	RNRH	4840	Bartang	UFJZ	88
Baikadam	RAK6	7495.5		RUC4	7537.6
	URK4	7894.5		RPQ9	9443
	RAK6	19425		UFZG	10122.3
	RNJ7	22358		UWYK	11657
	RNJ7	23990		UBSK	19419
Baisun				RNO7	22377
	ROJO	3805		UFFA	25047
	ROJO	5895	Batbakkary	RNAA	4420
	RAI9	7552.3		RSZ5	7672.3
	RBG8	8007.5		UWXT	13903
	RJY7	9377.5		RUB4	15590
	UTYY	10295		UYV3	15839
	RTB3	13366.5		RUB4	15845
	UYE7	16132.3		UYV3	20570
	UFTE	18306	Batkant	ROBE	2800
	UFBF	22352		ROBF	3300
	UFLI	24655		UCY5	4223
	UWIY	26397		ROBF	4555
Bakanas Balkha Chskii	RNEB	3630		RSV9	7332.3
	RNEB	21930		RPS9	7682.3
				UWIS	8123
Bakanas Tchuba Rtovskii	RNGT	3960		UTVE	11003
	RNEA	4620		RSY5	12893
	RNEA	20705		UWV6	13786
				RUU4	16220
Bakhty				UFYO	18937
	RNGP	3850		UCC9	20105

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Batkant	UZTO	24710	Bolche	UFIH	25366
(Cont'd)	UCC9	26280	Ganiuch		
Baumanabad	RONL	4380	Kino (Cont'd)		
Khlopsz	UCZ	4860			
	UCZ	19720	Bugun	UAL	4020
Belousovka	RNJJ	3310	Burdalyk	ROFV	4440
Selo	RNJJ	4560		RHT8	7402.3
	UTSI	18085		RDZ7	7842.5
	UTSI	19498		UZQD	9807.4
Bertych	RNGL	4385		UFRJ	10177
	RNEJ	4890		RGQ8	12113
	RNEJ	7975		UWYU	14706
	UCV8	20368		UFYM	18686
	UMG5	20374		RND9	22301
	UMG5	24865		UBGO	25075
	UFJH	25568		URO5	26373
	UCV8	26655			
Bestiube	RNQD	2510	Burliu	RNFK	4190
	RNQD	4420	Tiube	RNFK	6470
				RNFK	8360
Bolchaia	RHAN	3300		UCP6	14308
Viktorovka	RHAN	4280		UFWQ	18473
	RAO4	7537.6		UZFW	19574
	RDT6	8052.5		UCW8	20124
	UYN7	11685		UOI4	20358
	UYN7	15816		UZHM	25493
	RDT6	19655		UCW8	26384
	UZAT	22435			
	RAO4	24550	Buru	UTVH	3627.5
	UZAT	25084	Baital	RNGJ	4020
				RNGJ	6250
Bolche	RNMI	4265		UZX5	7405
Ganiuch	UWOA	5817.4		URV4	9255
Kino	UWOA	7787		URV4	26847
	URX5	10146			
	RNMI	14395	Burun	ENX	3525
	URX5	20860	Dai	UWFK	11665
	UWOA	24375			
	UZGW	25138	Bystryi	UBY	2625
			Istok	UBY	4065
			Chaambary	ENZ	3290

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Chaambary (Cont'd)	RONC	12695	Dargan Ata	ROFT	2755
Chaartuz	ROMU	2835		ROEG	3180
	ROMU	3550		UIE	3355
	ROMU	3895		ROEG	4065
	RONK	4380		ROFT	4440
	UGB	4940		UIE	4840
	UGB	5105		UIE	18995
	RBW	16950	Darvaza	ROFZ	2850
Chaidan	UCT4	3952		ROFZ	4640
	UWJZ	11080		UOY5	13727
	UZAA	18862		UZWS	18596
	UBJC	19339		RQU8	19480
	UZMW	24278		RQU8	20100
Chartandy	RNQR	4420		URN6	21910
Chemonaikha	RNJQ	4400		UOY5	21960
	RNJQ	14475		RQU8	25580
Chirabad	ROJO	3805	Debasta	ROOF	2840
	ROJP	5895		ROOF	4360
	ROJP	18940	Deinau	ROKY	2370
	UFFQ	20490		ROKY	2835
Churoabad	RONQ	3630		UFOL	5317.5
	UWZZ	4447.5		UTWW	8235
	RGV9	9066		UFOL	11475
	RQS5	12094		ROKY	18735
	UTQ6	13617		UZEC	23438
	UWW6	14331		UZEC	24295
	UMZ6	14583		UTWW	27474
	UYT3	15976	Denau	ROKY	3895
	UZP5	18837	Djalal Abad	UKR8	2800
	UZTB	24213		ROBC	4525
Churtchi	RQIV	4380		RIU8	8591
	ROIW	4535		RUD5	12197
	REL7	9187.3		RSG9	18630
	UZTG	11022.6		UBZQ	19094
	UGL5	26994		RDL9	20470
				UZWI	23648
				UWUU	26326

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Djanybek	RNMA	3820	Djetygara (Cont'd)	RDG	8035
	RIY8	8677.5		RNBA	8165
	RPV5	8752		RDG	14490
	UBGF	13187		RDG	14540
	RHY9	18778		RDG	14982.5
	RKX9	22341		RDG	15460
	UZSB	23522	Djilianda	ROOG	4360
	UYK5	27273		RWL9	5347.5
Djar Kurgan	UNT	4107.6		UBVZ	10367
	ROLY	6950		UBZO	10992
	UMF3	13864		RTL7	18133
	UTVO	26209		RIP5	19390
Djarkent	UBQH	19.3	Djilikul	UFMD	78.2
	ULK	3380		USH6	10795
	RNFE	3630		UBKS	11695
	ULK	4765		RAL7	15575
	RPY5	8562.5		RAL7	18552.6
	UZKE	9867		UBKS	18888
	UUU6	10265		RAI6	19210
	UWFE	13747		UZOM	23318
	UFMJ	18083		RAI6	24295
	UBVF	18245.5	Djizak	EOQ	3355
	RIT8	19219			
	UKI7	20476	Djurun	RNAN	3860
	UZOY	23182			
	UZWZ	23755	Djusaly	UFLF	47.15
Djergatol	RAL6	8187		RUW5	1759
	UBOJ	10715		UHB	3365
	UFAT	12435		UHB	4775
	UBOJ	13116		RQY9	8577.5
	RAL6	15785		UNE4	15503
	RAL6	20510		RFB6	15690
	UFAT	23191		UFPF	22488
Djetygara	RDG	3500		RTR4	23532
	RNAX	4420		UWB5	27285
	UHA	4760	Fedtchenko	ROKH	2370
	RDG	5150		ROKH	2835
	RDG	7435		ROKH	3895
	RDG	7700		ROKH	19555

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ
Fergana	ROKZ	2370
	ROJY	2775
	ROKZ	2835
	ROKZ	3895
	ROJY	4445
	UJT	4980
	RMJ7	9105.5
	UCA5	13963
Frunze	UJP4	14610
	UIJ	3550
	RUL	3790
	ROBU	4430
	UIJ	4920
	RUL	5060
	ROAI	5230
	ROBV	5830
	RUL	7580
	RUL	13137.5
	UCH9	13894
	UYV6	14763
	RUL	14967
	RCE9	18050
	RUL	20975
	RUL	26865
Ft. Chevtchenko	REG9	9253
	UCF4	12160
	REG9	14495
	EWK	19130
	UCF4	20299
	UZIY	22190
	UZIY	24326
Garm	UDD	3380
	UDD	4880
	ROMO	5190
	RBM 8	12245
	ROMO	12815
	UMP5	13768
	RFV8	15780
	RFV8	19270
	RUG8	19380

LOCATION	CALL LETTERS	FREQ
Garm (Cont'd)	UMP5	20450
	RUG8	23660
Gasani Kuli	ROFL	2030
	ROFL	2610
	UWDK	3545
	ROEU	5055
	ROEU	6280
	UWYT	14427
	UWCO	17127
	RIH7	18762
	RLM8	20310
	RIS5	26105
Gheorghievka	RLM8	26560
	RHA5	2847.5
	RNIS	3255
	RHA5	4145
	RNFD	4260
	RNIS	5040
	RIT6	8667.5
	UNB4	12185
	UVG4	13093
	UJT5	13665
	RIT6	17350
	RRM7	18056
	RIT6	22790
Guriev	UBM	2610
	RNMD	3350
	UCV	3380
	UEF	4082.9
	UJC	4095
	UEF	4235.6
	UGV	4975
	RNMD	5185
	RSE	5740
	UEF	6278
	UEF	8430
	RSE	9902.5
	RSE	11480
	UEF	12430
	UEF	18550

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Guriev	RSE	18165	Kalai Khumb	RONs	3630
(Cont'd)	RSE	26875		RONs	18800
Guzar	ROJM	3815	Kalatch	RGLF	2610
	ROJM	5895		RGLF	4010
	RFN9	8182		UFFM	5347.5
	RSV7	17515		RRV6	18437.6
	RFN9	17645		RGLF	18705
	RSI8	19247		UYJ3	20765
	RAH5	20280		RGLF	21890
	RNI9	22482		UZKK	23357
	RSV7	23250	Kanibadam	ROMZ	3310
	RFN9	23290	Kar	RNIG	12660
	RSV7	26153	Karalinsk		
	RAH5	26545	Kara Aul	RNIF	3625
Iany	RNUI	19150	Karabugaz	ROFE	3765
Kurgan			Karabutak	RNAQ	2850
Isfana	ROBD	2800		RNAQ	4295
	ROBD	3300		RQQ5	8594
	UWTU	3585		RQY6	8737.5
	ROBD	4555		UWJK	10287
	RST7	8602.3		UFLJ	10326
	RHL7	9446		RKM9	11647
	RCO8	12288		UZXB	13193
	UZVF	13612.5		UZYC	23357
	UTZO	17131	Karaganda	RNQW	3835
	UBMI	17600		RKG	3880
	RAP8	18120		RNQH	4385
	UZTK	18577.8		RDL	4675
	RQT7	19320		RDL	10160
	UBXU	22457		RDL	13067.5
Izberbach	RLLC	3310		RDL	21955
	RLLC	4610	Karakul	ROKK	2370
Jana Semei	UVL	3520		ROKK	2835
	UVL	4965		ROKK	3895
	UVL	16640		RQJC	4350
Kainar	RNIE	3740			
	RNIE	4280			

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ
Karakul (Cont'd)	ROMG	5750
Karchi	ROJI	3755
Karkaralinsk	RNIG	3600
Karsakpai	RNUT	3770
	RNXA	5750
	RNUT	19010
Kassan	RQIQ	2410
	RQIQ	2460
Katon Karagai	RNIC	3710
	RCA8	8707.7
	RCA8	12590
	UZRV	17535
	UBWT	18097.3
	UFQI	19789
	RNIC	20745
	UZRV	20910
	UZRV	23257
	RCA8	23630
Kauntchi	ROJX	2775
	ROJX	4445
	RTX8	5857.5
	RBN6	12912
	UZVY	14945
	UFVE	18292.7
	ROJX	19308
	RTX8	20700
	UZVY	23219
	UZBQ	23785
	RBN6	24235
Kazak Daria	ROQH	4020
Kazalinsk	UTYJ	13400
	RNUM	15645

LOCATION	CALL LETTERS	FREQ
Kenimekh	ROJR	2406
	RIT7	11505
	RIT7	15750
	UWPF	20775
	UWPF	27244
Kerki	UEF	2625
	UEF	4110
	ROEV	5245
	UWB7	13005
	ROEV	14935
	URW4	24730
Kermine	ROKL	2370
	ROKL	2835
	ROKL	3895
	ROLJ	5850
	RAK5	10297.4
	UWJM	11543
	UWIM	27362
Khazarasp	UJN5	3535
	RJD7	9157.5
	UFMQ	10692.6
	UZOG	13875
	RJD7	17405
	UFKQ	20830
	UZOG	24122
	UFKQ	26183
Khiva	RIW	146.45
	RUC7	7952.5
	RAW5	12057
	RAZ9	12125
	UTRN	19650
	UTRN	20480
	UZBM	20580
	UZBM	24382
	RAW5	24435
	UTRN	26317.5
Khodjeili	ROQJ	3840
	ROQA	4005

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Khorog	ROMY	3380	Kizyl Arvat	UGH	3365
	RONI	4550		ROEW	4125
	ROMY	4780		UGH	4800
	ROMY	12445		ROEW	5220
Kim				RSS5	20410
	UBMX	62.1		UGH	22165
	RONH	3290		UWVG	24450
	UFCV	5897.4	Kokand	ROJW	2775
	RIW7	9491		ROJN	3815
	UWLH	12927		ROJW	4445
	UVC3	14933		ROJN	5895
	UBUH	17550		UFRG	13083
	UCZ4	20826		ROJW	15565
	UCZ4	27180		UXO6	19605
Kitab				ROJN	19860
	ROKG	2370		UFRG	22180
	ROKG	2835		UNK5	22255
	ROKG	3895		UXO6	26231
	RNE9	10402.3	Kok Iaigan	ROAM	3670
	RNE9	16895			
Kizil Kia	UZH3	26783	Kolpachevo	UBQ	2540
	ROBG	2800		UBQ	4080
	ROBG	3300		RSKR	4525
	ROAL	3670		RHDI	5140
	ROBG	4555	Krasnogorka	RNFL	4260
Kizil Kup	ROAL	5380		UWG6	4332.6
	UBHX	5827.3		UBTR	5222.5
	UZZO	18130		RQK7	9462
	UPG5	19810		UTZS	11572.6
	UZZO	23247		UTXK	13107
Kizil Su	UBHX	24760		UWG6	15493
	ROFG	4005		UXO5	2677
	UTD5	7915	Krasnovodsk	ROFK	2610
	RPE7	8732.5		ROGB	3245
	RPE7	10125		RNH9	4170
	RLN9	16955		UBHZ	10487.3
	UZU4	19565		RNH9	10582.3
	RLN9	20290		UFSG	10742.2
	RLN9	22805			
	UZU4	26165			

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ
Krasnovodsk (Cont'd)	UBIH	11077.3
	RRD8	11983
	RNH9	16560
	RNH9	16700
	RNH9	16740
	RNH9	22260
	RNH9	22397
	UWMU	27238
Kuliab	ROMW	2835
	UCY	3395
	ROMW	3895
	UCY	4880
	ROMN	5085
Kungrad	UBP6	13135
Kunia Ur Ghentch	ROFN	2850
	ROFN	4640
	ROFN	20695
	USK6	25205
Kurgan Tiube	ROMX	2835
	ROMX	3895
	RONM	4380
Kustanai	UCN	3370
	RGL	3645
	RNAM	4550
	UCN	4870
	RGL	5945
	RGL	9805
	RDV	12760
	RDV	12970
	RGL	13130
	RDV	13477
	RGL	16215
	RGL	17465
	RGL	18427.5
	RGL	23690
Kzyl Orda	RNUO	3700
	UBYU	5312.5

LOCATION	CALL LETTERS	FREQ
Kzyl Orda (Cont'd)	RPA8	9402.5
	UBWR	10533
	UBWR	12570
	UYT4	19520
	RNUO	19775
	UBYU	20140
	UVK7	20355
	UZRU	22085
	RQH5	22160
	UZRU	23337
	UVK7	27253
Kzyl Tuk	RNSO	3300
Leninabad	UVU7	3160
	ROMQ	3895
	ROMV	4280
	UZBP	9786
	UZSO	9915
	UOO5	13777.5
	UFOF	19361
	RUZ5	20600
	UFJN	22616
	UWOL	27168
Lepsy	RNGM	4385
Makinka	RNQC	2510
	UZPC	3777.6
	RNQC	4420
	RAG5	8102.5
	UBI5	13973
	UKU7	14618
	RGC9	16290
	UZMA	19597
	UKU7	20767
	UBLT	22764
Massy	ROBE	3300
	ROBE	4555
	RMZ7	9352.5
	UBKZ	12853
	UPV6	13737

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Massy (Cont'd)	UNE5	14674	Murgab	ROOE	2840
	UWBU	16357.2		UTZM	3605.5
	RAY9	20710		ROOE	4360
	UFJI	22959		ROMD	5750
				UCJ9	13693
Mattcha	RONE	3630			
Muinak Ostrov	UWE7	3572.3	N Bukhara Kagan	ROJH	3610
	UWK6	4067.3		ROJH	5760
	ROQC	4080		UWFD	13525
	RIJ7	12305		UZVB	20038
	ROQC	12355		RIA9	20870
	UVD6	12400	N Urghentch	UYG	3605
	UBWI	12525		ROKE	4320
	UWK6	16485		ROIU	4535
	RLJ7	19167		UYG	4760
	ROQC	20770	Namangan	ROKP	2370
	UBWI	22987		ROJT	2775
	UVD6	26643		ROKP	2835
Mukry	UZUX	3792.3		ROKR	3895
	UFK	4322.4		ROJT	4445
	ROFM	5220		ROIX	4535
	RQG8	5377.6		RMG9	9367.6
	RMP9	9372.5		UFJJ	12863
	UTX8	10787		UZDA	19917
	RFR9	12266		RLI7	20850
	UWHH	13493		UBYK	22629
	UFDC	19651		UZDA	25400
	UBOD	22514	Naryn	ROBL	3670
Muminabad	UWS6	3614.6		ROAJ	4370
	ROOC	3630		UWPI	11439
	ROOC	4380		UMC6	13707
	ROOC	6510		UTN5	14507
	USX7	11017		RGE8	16230
	RQB9	12836		UBPP	19017
	UJV5	13760		RFX6	19158
	UTVM	16352.4		UCE7	20819
	RRP7	19082		UFUP	22932.5
	RTI9	22533		RGE8	27202
	UFXF	22654	Nau	ROMM	3310
	UZUJ	23021			

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Nau (Cont'd)	UXU6	3662.4	Petropavlovsk	RVV	5165
	UWUF	10577	Karagand	RVV	10330
	USG6	12140	(Cont'd)		
	UFBP	13063	Presnogor-	RNSS	2840
	USG6	13803	kovka	RNSS	4350
	UWA7	14825	Prjevalsk	ROAK	2820
	UPL5	15906		ROAK	3790
	UWUF	16935		ROAK	4555
	UWA7	16995	Rider	RNJD	3310
	UFBP	19765		RNJD	4560
Nijnii Piandj	UWUF	23045			
	UWUF	23385			
Och	ROMH	2595	Samarkand	UVH	3520
	ROMH	4020		UYH	4415
	UWTB	13160		ROIS	4535
Ogurtchinsk Os	ROBH	2840		UYH	4940
	ROBH	4360		RKN9	5437.7
	ROAP	4505		ROJE	7360
	UHH	4860		RQM6	7912.5
	ROAR	4890		UOQ3	14277
Panfilov				RIV9	18037
	RKQ9	37		RTD9	18520
	ERQ	4190		UKQ8	20839
	UWGY	11025		RAD23	21772
	UZU5	13646			
Parkhar	UBT7	27143	Sary Tach	ROBO	2840
				ROBO	4360
Pavlodar	RLA9	9417.7		ROAC	5170
				UBPI	9927.3
Pavlovsk	ROMT	2835		UZSE	10702.3
	ROMW	3895		REI7	12946
				UKR5	16005
Pavlovsk	UWB	2630		UFGP	21779
	UWB	4110			
	UWB	8285			
Pavlovsk Karagand			Semipalatinsk	RAF8	2622
	RTRV	3855		RNJR	3255
	UVM	3995		RNIZ	3310
	RNQM	4350		RNIA	3340
	UVM	4840		RNIB	3740
	RNQM	5080		RNIB	3890
				UZF	4050

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Semipalatinsk (Cont'd)	RNIA	4280	Serakhs (Cont'd)	UFQK	22060
	RNIZ	4560			
	RNIB	4590	Stalinabad	ROMJ	2490
	RNJR	5040		ROMI	3500
	RNIA	5090		ROMI	3725
	RNJA	5130		ROMS	3895
	RNIB	5420		RVF5 1	4450
	RMC7	6922. 5		RUK	4610
	RNIB	7480		RUK	4640
	RFLS	7582. 5		UCR	4920
	UZF	8275		ROMI	5415
	RWK	9330		RUK	7450
	UZPW	10617		RQW7	8062. 5
	RWK	10645		RMA7	12147. 5
	UZF	11060		RML7	12183
	RJP7	12067		UTXU	13523
	UKT5	13934		REM	14602. 5
	RAW9	15920		RUK	14622. 5
	RWK	17225		RUK	14773. 2
	RUY9	18157. 2		REM	14880
	RCJ7	18510		RNM	14900
	UFUW	18676		RFF5	15870
	RWK	20925		RUK	16317. 5
Sentach	RAV5	1849		RQQ7	18062. 7
	RNIW	2510		RSR5	18590
		2510		REM	20945
	RNIW	3245		REM	26880
	RNIW	4560	Stepniak	RSD5	2281
	RNIW	5040		RNQB	2510
Serakhs	ROET	5245		RCN	4420
	RFR5	7882. 5		RNGB	
	RQL9	9865		RCN	5150
	UZXT	16000		RCN	7435
	RQL9	16020		RCN	7700
	ROET	16105		RLF8	7857. 8
	RAB9	16795		RCN	8085
	RAB9	18490		UFIL	13196
	UZXT	19137		RCN	13660
	RCN8	19915		RCN	13980
	UFQK	21761		RCN	14490
	RTS3	21775		RCN	14657

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Stepniak (Cont'd)	RCN	15460	Tachkent (Cont'd)	ROIM	4400
	RDZ8	18570		ROJV	4445
	UFDW	18897		UXB	4860
	UFRI	20032		RCH	4990
	UFRI	25530		RAQ	5010
	UFRI	26155		RRH	5015
	UWMQ	26592		RAQ	5030
Suliukta				RRH	5065
	ROAO	3670		ROKV	5080
	RTE9	5402.6		ROKV	5100
	UYM5	10305		RRH	5160
	UMW6	12005		RRRR	5380
	ROAO	14585		RPA	5800
	RIF9	15830		RPT	5800
	RQI6	18950		ROIP	5865
	RIF9	21920		UXB	6480
	UYM5	22025		RJM7	6767
	UWXF	22390		RAD	6820
	UWXF	27392		RDG2 ₂	6845
Tachauz				RVM	6852.5
	RAC8	2059		RDG2 ₃	7315
	ROEP	5900		RAD	7440
	UFRV	6973		RPT3 ₀	7560
	UCH7	13530		RIM	7585
	UMO6	14594		RIM	7625
	RHK6	16170		RIM	7626
Tachkent				RRRR	7692
	RAU	95.7		ROB	7715
	UYF	2670		RQIC	7770
	ROJV	2775		RRRR	7880
	ROIM	2810		RCH	7890
	ROKU	3320		UXB	8450
	ROIG	3505		RCH	9075
	ROIG	3575		RVN	9400
	ROIK	3670		RRRR	9460
	RVM	3690		RRH	9855
	RAQ	3870		RCH	9895
	RAQ	3875		RAQ	9980
	RQIC	3895		RPT3 ₁	10110
	RVM	4085		RRRR	10120
	ROII	4260		RRRR	10140
	ROJG	4320		RRH	10180
				RRH	10190

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTER	FREQ
Tachkent (Cont'd)	RRH	10200	Taldy	RSL5	18905
	RCH76	10250	Kurgan	UBM6	20900
	RRH	10385	(Cont'd)	UBVH	21875
	RPA	10515		UBM6	27103
	RVN	10735	Tamdy	ROQL	3700
	UZCP	10828		ROQG	5475
	RPA	10980		UZPD	17025
	RPA	11600		ROQL	19020
	RPT	11600		UZPD	19734
	ERD	12220		RCX8	22015
	ERE	12230		ROQG	25180
	UXB	12960		UZPD	27059
	RRRR	13470	Tatarskaia	UZW	3500
	RRRR	13540		UZW	3995
	RPT36	13565		UZW	4166. 6
	RAD	13650		UNN4	4382. 5
	RRRR	13720		UZW	4920
	RAD	13760		RJF9	9066
	RRRR	13820		UWEF	9205
	RRRR	13840		UBUR	10252. 4
	RPA	14417. 5		UWZY	10487. 3
	RDG29	14520		UBNA	11403
	RPA	14630		RPX9	12297
	RRH	14635		RJJ8	13164. 5
	RRH	14950		UWKH	14713
	RCH	15452. 5		UXS6	15949. 3
	RPA	15570		RTT9	19054
	ROB	15740		RRK7	19692
	RRRR	15825		UZBB	23967
	RPA	16187	Tchagon	ROOD	3630
	RAD	16252. 5		ROOD	4380
	RAD	16320		ROOD	9490
	RIM50	18140	Tchardjou	ROFU	2810
	RIM	19885		UID	3365
	RAD	20315		ROFU	3760
	RAQ	20585		ROEF	4040
	RRH	20935		ROEO	4065
	RIM	20955		ROEF	4140
	RRH	23110		UID	4900
Taldy Kurgan	RNEI	3360		ROEX	5150
	RNEI	4910			
	UBVH	10292. 7			
	RRW9	13486			

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Tchardjou (Cont'd)	ROEF	6210	Teretie (Cont'd)	RUH8	12083
	ROEO	6310		UTZ6	14331
	ROEF	6430		UVK4	16394
	ROEF	6465		UXL7	17324.6
	ROEF	8255		VOX3	20473
	ROEF	8280		UBLV	23879
	ROEF	17670		UOX3	26755
Tchatkal	ROAD	5170	Termez	UWB6	27318
	ROAD	21860		UUZ	3165
Tchetsk	RNQN	4440		RXF	3340
	RNTX	4860		UUZ	3500
	RNQN	16400		ROKR	3895
Tchimbai	UJJ	3505		UUZ	4080
	UJJ	3855		ROJJ	4300
	UJJ	4920		ROIY	4335
	UJJ	13735		ROIY	4535
Tchimkent	RNYB	3290		UXA	4780
	RWL	3520		ROIY	6315
	RNWT	4310		RXF	6880
	RWL			RXF	7645
	RNO8	5136		UOW3	13913
	RNUB	6960		UF XU	18162.5
	RWL	8630	Tian Chan	ROAF	5170
	UBSR	9982.2			
	UFPR	10557	Turgolan	ROMA	4380
	UFSN	10972.3		ROMA	19360
	RNO8	13562	Turkestan	RDH8	2827.5
	UMB5	14703		RNUK	3520
	RWL	20455		RNUK	3710
	UWL8	26237		RNUY	3995
Teretie	UCI	2530		UCP7	4277.5
	UCI	2565		UFWO	6933
	UUM6	3675		RTG6	12192.5
	UCI	4040		UFWB	13447
	RDN6	9115.5		UWTJ	14533
	UWON	9205		UOC3	14570
	RJE8	9277.5		RBK7	16070
	UWAC	10388		UTYH	26195
			Turtkul	ROQB	3165

Radio Communication Stations: Frequencies to 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Turtkul (Cont'd)	ROQB	4005	Urga Ostrov (Cont'd)	UCH4	14307
	ROQF	5110		UFMF	17370
	ROQF	18795		UZCL	24004
Ulutau	RNWR	5110		UJB5	26285
	UUT7	13615		UUS3	27324
	UWA5	24820	Ust Kameno Gorsk	UXM	2610
Ura Tiube				UXM	3165
	USJS	3637.6		UXM	9345
	RSL7	3827.4		RDB	24790
	RSL7	4135	Uzun Kair	RNAF	4050
	RONN	4375		RNK9	16595
	UBE6	10445		RNK9	18402.7
	UWOB	11683		UFNZ	24222
	UBUB	12505		UUB4	27312
	UBE6	13715	Zyrianovsk	RNIU	3310
	UJC5	14545		RNID	3600
	RONN	15885		RNIU	4560
	UBUB	16004.8		RRO9	8712.5
	UWOB	16885		RRO9	10472.4
	UZV6	27342		UBVG	10512.4
Uralsk	RNNQ	3280		UFBT	10962.6
	UHI	3505		UTVW	17124.8
	RNNO	3625		RAD5	18357.2
	UBW	4020		RDU8	18706
	UHI	4935		RUU8	19170
	RNMJ	5125		UZTA	23309
	RWA	5465			
	RWA	9135			
	RWA	10460			
	RWA	10930			
	RWA	11550			
	RWA	11670			
	RWA	17385			
Urdjar	RNGQ	3850			
Urga Ostrov	UCG5	3992.6			
	ROQD	4020			
	RJU8	9052.5			
	UFTL	10197			
	UZNH	10937.3			

**Radio Communication Stations: Frequencies to 27500 kc.
(Additions)**

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ
Aksuat	RFJ9	7592. 6
	UBIP	10242
	UBSI	10346. 6
	UZNE	10726
	UFQN	10806
	UBLY	19261
Kazgorodok	RNQG	3880
	RNQO	5080
	RNQG	19280
	UBF7	24890
Keg Ostrov	UBC	3605
Murgabad	UTZG	13685
	UVJ4	16256
	UVJ4	17475
	RSO5	19179
	UVJ4	22945
Nur Ata	ROIL	2460
Slavianska	EWB	22000
	EWB	2250
	UDA	4000
	RNWV	4610
	UDA	16455
	RNU8	18745
Vantch	UWQU	3892. 5
	RIQ8	7355. 5
	UBQL	10317
	UZSH	14895
	RIQ8	17295
	UZSH	17585
	UZSH	18737. 6
	RRJ7	18846
	UBQL	20950
	RIQ8	23100
	UZSH	24775
Zaisan	RNIM	3710
	RNIM	5420

LOCATION	CALL LETTERS	FREQ
Leninabad	RSH56	325. 5
	RSC75	1027. 63
Naryn	RSC72	162. 3
Och	RSH28	158
	RSG24	299
	RSL85	3422
Prjevalsk	RSJ80	327. 5
Samarkand	RSK51	1025. 06
Stalinabad	RSD80	34
	RSJ79	218. 6
	RSG43	263. 3
Tachauz	RSH64	297
	RSY75	426. 4
	RSB34	987. 4
Tachkent	RSD23	75. 65
	RSA98	162. 5
	RSG84	225. 6
	RSJ23	293
	RSN58	402
	RSB24	989. 4
	RSN50	2020
Taldy Kurgan	RSE43	159. 5
	RSH35	321
Tchardjou	RSB60	983. 85
Termez	RSB89	75. 3
	RSC35	220. 1
	RSG37	297. 5
	RSN53	411
Uralsk	RSG83	999. 25
Ust Kameno-gorsk	RSK66	327

Fixed Stations:

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
(Reported since 3/59)			Coast Stations		
Achkhabad	RNI	7590	Baltino-Posiolok Radio	UKM	1560 1620 1648
Alma Ata	RRRB	4150			
Guriev	RNMV	4110	Fort Chevtchenko	UCG	500 530
Krasnovodsk	RAP	4080		UCG ₁	4140 4410
	RAP	6340			
Karaganda	RKG	8100	Gur'yev Radio	UEFI	1560 1620 1645
Khorog	RONZ	4550			
Parkhar	RONN	4380	Jilaia Kosa Radio	UNG	3105 4140 4170 6180
Tachkent	EKZ	12130			
Tchimkent	RNXB	4535	Krasnovodsk Radio	UBD	375 425 435 438 454 500
Frequencies above 27500kc					
Tchardjou	RSB60	983.85	Kouli Maisk Radio	UAX	375 425 454 500
Termez	RSB89	75.3			
	RSC35	220.1			
	RSG37	297.5			
	RSN53	411			
Uralsk	RSG83	999.25			
Ust Kameno-gorsk	RSK66	327			
(Reported Since 3/59)					
Akhtiubinsk	EKJ	32.75			
	EKJ	40.6			
Alma Ata	EWQ	31			
	EWQ	43.3			

Fixed Stations: Frequencies above 27500 kc.

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Achkhabad	RSC73	31.95	Krasnovodsk	RSB27	293.5
	RSJ67	161.8		RSH58	323
	RSA41	247.6	Kuliab	RSG66	75.85
	RSH58	262.5		RSC37	157.5
	RSB70	961.7		RSA83	291
	RSM98	2135		RSN86	377
	RSN57	5920		RSL79	3410
Alma Ata	RSK80	38.1	Leninabad	RSH56	325.5
	RSA50	157.5		RSC75	1027.63
	RSJ48	235.6	Murgab	RSK36	297
	RSA54	321.5			
	RSN97	373	Naryn	RSC72	162.3
Andijan	RSO77	132.5	Och	RSH28	158
Djambul	RSJ28	323.5		RSG24	299
Frunze	RSB69	160.32		RSL85	3422
	RSA97	290.7	Prjevalsk	RSJ80	327.5
	RSN96	460.5			
Gasam Kuli	RSD38	296.5	Samarkand	RSK51	1025.06
Guriev	RSD26	162	Stalinabad	RSD80	34
	RSC64	324.5		RSJ79	218.6
	RSG27	434		RSG43	263.3
	RSO37	2125		RSN94	7400
Karchi	RSA55	164.7	Tachauz	RSH64	297
	RSD89	299		RSY75	426.4
Kerki	RSH82	163.8		RSB34	987.4
	RSK44	321.5	Tachkent	RSD23	75.65
Khorog	RSE45	156.7		RSA98	162.5
	RSB71	430.5		RSG84	225.6
	RSM48	2542		RSJ23	293
Kizyl Arvat	RSC92	75.95		RSN58	402
	RSL22	379		RSB24	989.4
				RSN50	2020
			Taldy Kurgan	RSE43	159.5
				RSH35	321

Aeronautical and Aircraft Stations

(Source: International Telecommunications Union, October 1958)

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Akmolinsk Aeradio	UNJ	3400 4790 6650	Kizil-Arvat Aeradio	UGH	3365 4800
Alma-Ata Aeradio	UMX	3995 4830 6585 11390 13310	Kuliab Aeradio	UCY	3395 4880
	YYI	3995 4830 6585 11390 13310	Kurapatkino Aeradio	UKAI	3470 4900
Baumanabad Aeradio	UCZ	3485 4860	Muinak Aeradio	UXQ	3485 4760
Chadrinsk Aeradio	UQR	3425 4820	Novyi Urghentch Aeradio	UYG	3470 4760 6650
Dargan-Ata Aeradio	UIE	3355 4840 6650	Stalinabad Aeradio	UCR	3410 4920
Djetygara Aeradio	UHA	3410 4760	Samarkand Aeradio	UYH	3440 4940
Djizak Aeradio	UKE1	3355 4995	Tachkent Aeradio	UXB	3425 4860 6480 6605 8450 11310 12960
Frunze Aeradio	UIJ	3455 4920 6650		UYF	2670 3950
Garm Aeradio	UDD	3380 4880	Tatarskaia Aeradio	UZW	3410 3995 4920
Jana-Semei Aeradio	UVL	3440 4965 6650	Tchardjou Aeradio	UID	3365 4900
Kalai-Khumb Aeradio	UBF	3440 4860	Tchimbai Aeradio	UJJ	3425 4920

Aeronautical and Aircraft Stations

CENTRAL ASIA

LOCATION	CALL LETTERS	FREQ
Termez Aeradio	UXA	3410 4780
Turtkul Aeradio	UJF	3920
Uralsk Aeradio	UHI	3425 4935 6650

Radio Communication Stations: Frequencies to 27500 kc.

SOUTHEASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Aleksandrovsk Zavod	EKB	3245	Bogorodsk	RTKS	3320
Baiandai	RTPH	3320		RTKS	5753
	RTPH	6765		RTKS	9845
Barguzin	RTRN	2825		UXL4	10344
	RTRN	6200		UWBK	15797. 6
Biriuza	RTOW	3330		RAC7	19179
	RTOW	4325		UFRO	19760
	UCY8	4488		UKJ7	20641
	UBB6	7925		UWBK	21970
	UWUF	10190		UXL4	23585
	UZQR	11051		UKJ7	23700
	UPU6	13646		UFRO	24729
	UYO7	14957	Bolchaia Raz Voznaia	RTRE	3740
	UVK6	16267. 2			
	UMQ4	20117	Borzia	RVNB	2810
	UZHF	24604		UWOH	3585
Bodaibo	RCR	5150		RVNB	3590
	RCR	7435		RTTJ	3780
	RCR	7700		UZRZ	3792. 3
	RCR	8005		RFY5	7712. 5
	RCR	13662. 5		UWYQ	10155
	RCR	14490		UXS5	11487
	RCR	15460		UWTX	13786
Bogdarin	RIO9	3325		UZQP	16077. 5
	RTQL	4440		RFE8	19219
	UOO3	4567. 8		UZKJ	25210
	RPA6	5067. 4		UZLD	25577
	RMS7	6797		UFAD	26255
	RQT6	7422. 3	Botchkarevo	RTJM	3260
	UWHT	7787		ENW	3550
	RGW9	9372. 5		RTJM	4300
	UZZG	11017		RAJ	4375
	UFTP	13507		UCS6	4612. 3
	UEH5	14533		UBH	4760
	UWVJ	16137. 2		RTP4	5242. 7
	UBOQ	19488		UFFW	5762. 3
				RFW5	7672. 3
				RFG5	7807. 5
				RAJ	8630

Radio Communication Stations: Frequencies to 27500 kc.

SOUTHEASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Botchkarevo (Cont'd)	UBGY	10647.3
	UFZU	10957.6
	UZVP	11063
	UFZU	13587
	RSZ7	18610
	UFOD	19043.5
	RTC7	21779
	UZIX	24664
	UZUR	25393
Burkan	UZQV	19801
	URN5	20080
	UCK6	20358
	UFNR	20420
	UFNR	21830
	RIP8	22130
	UCK6	23780
	UFOG	24775
	UZQV	25250
Chakhtoma	RTQR	2510
	RTQR	4580
	RTQR	10785
Chelaevo	RTNZ	3820
Dambuki	RVJO	3305
	UBOZ	5927.3
	RVJO	8115
	RAY8	8588
	RCI7	9382.5
	RCI7	12410
	RSE8	15725
	UBYH	18265
	UFGK	18402.7
	RSE8	18650
	RAY8	20130
	UBOZ	21830
	UBYH	22790
	UBYH	23293
	UFGK	23595
Darasun	UBJG	20.6

LOCATION	CALL LETTERS	FREQ
Darasun (Cont'd)	RPUS	1759
	RTSP	4280
	RUM5	8179
	UBYR	10697.4
	UBIZ	13047.5
	UYH3	14723
	UZTZ	15474
	RSQ9	18170
	UFPQ	18497.8
	UFMV	18766
	UBTZ	18968
	UZSG	19677.6
	UZBS	23735
Dauria	RTVZ	5360
	RTVZ	21935
Duldurga	RTRJ	3305
	RTSH	4260
	UMX5	4538.1
	RUL7	8187
	RLG9	9467.5
	RTK5	10542.3
	UFWF	10816
	UVY6	15693
	UBS7	17203
	RHI5	18593
	UTRZ	26159
Erbogatcheni	RTOM	21855
Erofei Pavlo Vitch	RTKF	3240
	RTKF	4270
	RTKF	4310
	RTKF	21810
Gruznovka	UUD	3500
	UUD	4920
Irkutsk	RPL8	1607
	RBZ8	1734.2
	RBO9	2055
	RHG8	2128

Radio Communication Stations: Frequencies to 27500 kc.

SOUTHEASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Irkutsk (Cont'd)	RTVA	2755	Irkutsk (Cont'd)	RRRM	6865
	RHK9	2803		RVH	6937.5
	RTQC	3245		RBT54	6970
	RWQ	3850		RRRN	7323
	UUJ	3995		RRRM	7350
	RTSZ	4045		RBT	7395
	RTSZ	4115		RTZ	7395
	RVH	4270		RCQ	7435
	RCQ	4310		RWQ	7435
	RQO	4400		RTZ	7437.7
	RKM	5410		RRRM	7535
	RTVA	4525		RRRM	7615
	RKR74	4560		RSO9	7662.3
	RTOS§	4765		RCQ	7700
	RRRN	4838		RWQ	7700
	UUJ	4840		RID27	7760
	UKD	4880		RRRM	7770
	RBT51	5010		RRRM	7780
	RYY	5070		RBT57	7820
	RKM	5110		RRRM	7850
	RRO			RRRM	7860
	RYL	5120		RRRM	7910
	RCQ	5150		RID28	8030
	RYK	5160		RCQ	8040
	RKM	5172		RBT	8055
	RQO	5172		RTZ	8055
	RYV	5200		RRRM	8060
	RKR76	5280		RWQ	8112
	RRRO	5340		RRRM	8130
	RID22	5425		RTSZ	8300
	RQT	5430		UUJ	8460
	RRRN	5440		RRRN	9050
	RID	5465		RRRN	9070
	RKR78	5740		RYL	9090
	RBT	5745		RRRN	9130
	RTZ	5745		RRRN	9290
	RKM	5800		RID	9340
	RKM	5835		RRRN	9340
	RTSZ	6420		RRRN	9390
	RRO	6450		RRRN	9410
	UUJ	6490		RRRN	9420
	REA7	6767		RRRN	9470
	RNT71	6775		RRO	9790

Radio Communication Stations: Frequencies to 27500 kc.

SOUTHEASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Irkutsk (Cont'd)	RRRN	9850	Irkutsk (Cont'd)	RBT	11490
	RRRN	9870		RNT	11490
	RRRN	9890		RQO	11570
	RTZ	9905		RNT76	11590
	RRRO	9935		RGV50	11670
	RRRO	9950		RER	12120
	RRRO	9975		RQO	12165
	RRRL	10195		UUJ	12720
	RRRO	10205		RVH	12840
	RRRO	10230		RVH	13010
	RYK	10240		RVH	13382
	RRRO	10260		RYL	13520
	RKM20	10290		RBT	13550
	RRRN	10300		RTZ	13550
	RKM	10344		RYK	13580
	RQO	10344		RRRL	13620
	RRRM	10350		RYV	13775
	RRRO	10410		UUJ	13843
	RYY	10450		RRRL	13860
	RYY	10485		RQO	13900
	RRRO	10490		RNT79	13900
	RRRO	10500		RRRL	13910
	RRO	10510		RCQ	14490
	RRRO	10510		RWQ	14490
	RYV	10510		RRRM	14545
	RRRO	10550		RRRM	14550
	RHL35	10595		RRRM	14555
	RRRO	10630		RRRM	14560
	RID	10695		RRRM	14570
	RRRO	10740		RRRL	14575
	RRRO	10850		RTSZ	14770
	RQT	10860		RBT	14790
	RRRO	10890		RTP70	14790
	RNT75	10900		RWQ	14912.5
	RTZ	10900		RRRL	14930
	RRRO	10920		RCQ	14977.5
	RID	10930		RCQ	15460
	RKM	10950		RWQ	15460
	RRRO	10970		RRRL	15490
	RQO	11000		RKM26	15610
	RQO	11465		RRRL	15700
	RKM23	11470		RRRL	15730
	RYI	11470		RTZ	15842.5

Radio Communication Stations: Frequencies to 27500 kc.

SOUTHEASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Irkutsk (Cont'd)	RTP71	16020	Kabaktan	RTWW	2510
	RFM27	16060		RTWW	4100
	RBT	16135	Katchug	UJO	2565
	RBT	16160		UJO	2640
	RTZ	16160		USI	3180
	RRRL	16175		UJO	3195
	UUJ	16870		RTPA	3280
	RRRL	17460		UJO	4005
	RKM	17482.5		UKM6	4020
	RRRL	17490		RTPA	4530
	RRRL	17500		UKM6	6430
	RRRL	17510		RTPA	19025
	RTZ	17615	Kholbon	RTUD	2510
	RRRL	18050		RTUD	4580
	RRRL	18070	Kiakhta	RTPD	3770
	RTZ	18070		RTPD	5030
	RRRL	18100		RTPD	6905
	RLK	18710		UUN5	25160
	RKM	20365	Kirensk	UDW	2565
	RID	20445		UDW	2640
	RID	20590		UDW	3195
	RRRO	20865		UDW	4005
	RNQ20	22860		UJO	4050
	RBT	23170		RTOL	4560
	RID	23620		UJO	6450
	RDR2	23670		RTOL	7615
	RBT	27030		UJO	8340
Istok Baikal	UVW	3365	Kudetcha	RTKU	3245
	UBA6	4940		UFJS	3845
Itaka	RVMS	3245		RBF5	8797
				UFOZ	9846
Jigalavo	UGF	2565		UFYF	18133
	UGF	2640		UFJE	18223
	UCM	3165		RUW9	19241
	UGF	3195		RTG9	22494
	UGF	4005		UWBJ	26775
	UCM	4040	Kutulik	RTOR	3700
	UGF	4340			
	UGF	12600			
	UCM	14420			

Radio Communication Stations: Frequencies to 27500 kc.

			SOUTHEASTERN SIBERIA		
LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Kutulik (Cont'd)	UWPW	13395	Nijne	RTQB	3770
	UWV5	25192	Angarsk (Cont'd)	UMA	4190
Kyren	RTRH	3265		RTQB	5030
Mogotcha	UXB4	3186	Nijne	UWQE	25100
	RTJY	3245	Udinsk	RTQD	3330
	UXF7	3501		UUH	3505
	UXF7	3550		RTQD	4325
	RTJY	3880		RTQD	4980
	UYQ	4840	Oloviannaia	RTRL	3720
	RRX9	5015		RTOK	4410
	RCS	5150	Petrovsk Zabaikal	RTSU	2195
	RCS	7435		RTSU	4290
	RCS	7700	Skovorodino	RTJO	3320
	UBRA	9987.6		RTJO	4430
	UZE5	10613		RTKD	4430
	UZCN	10767.2		RTJO	15950
	UBJU	12937		RTJO	17285
	RCS	13366		RTKD	21885
	RER7	13393	Sretensk	RTOX	2510
	RCS	14490		RTUH	3850
	UWGA	14847		RTOX	4580
	RCS	15460		UCE	18755
	RCS	15652.5		RTOX	21895
	UWOJ	15906	Taichet	UVX	2730
	UZP3	17442.2		UVX	4875
	UFYC	18457.8		UVX	19115
	RCS	19228	Tchita	RRRX	49.55
	RTC5	20038		RRX	86.6
	UMW3	20819		RTOT	2510
	UBWO	22681		RCK9	2817.5
	UZVG	23029		RVI	3330
Nertchinsk	UUG	3505		UUL	3395
	UUG	3520		RTRR	3700
	RTRO	3610		RVNE	3800
	UUG	4780		RTOJ	4335
Nertchinskii Zavod	RTUE	3750		RTOV	4340
Nijnne Angarsk	UMA	3195			

Radio Communication Stations: Frequencies to 27500 kc.

SOUTHEASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Tchita (Cont'd)	RRP	4450	Ulan Ude (Cont'd)	UTR	2630
	RTOT	4580		UTR	3165
	RVI	4985		UTR	3550
	RVR	5050		RTNR	3625
	RVNE	5400		RVY	3880
	RRP	5830		UTR	4025
	RVI	5920		UTR	4050
		7435		RVY	4070
	RDX7	7472.3		UTR	4110
	RVI	7575		UOA4	4175
	RCV9	7602.6		ERR	4190
	RTOY	7700		RTOH	4300
	RRP	7720		RTNR	4505
	RVI	9970		RTNR	4535
	RRP	10105		UUM	4860
	RVR	10280		RTUI	5190
	RRP	10878		RVY	5190
	RRP	11680		RVY	5918
	RMK7	12033		RTI6	6997.5
	RRP	12320		RVY	7760
	UKB6	13917		RJT8	9182.3
	RTOY	14490		RVY	10380
	RTOY	15460		UTR	13957
	RRC2	15545		UTW4	14731
	RRP	16125		RBD9	18112.2
	RRP	16195		RPA9	18490
	RTOY	16830		UFDP	24335
	RVR	17427.5		UTE8	26391
	RDO8	18197.8		RVY	26860
	RVR	18320	Ust Kara	RTQN	2510
	RRP	19955		RTQN	4580
	RRP	20495		UXG5	13515
	RVI	20575	Ust Kut	UMO	2565
	RRP	22850		UMO	2640
	RVR	22915		RTVB	2755
	RTN5	24299		UMO	3195
				UMO	4005
				UTJ	4090
				RTVB	4525
				UTZV	12865
Tsipikan	RTQU	2510			
	RTQU	4580			
	RTQU	7875			
	RTQU	14645			
Ulan Ude	UTR	2550			

Radio Communication Stations: Frequencies to 27500 kc.

SOUTHEASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Verchina	RTOF	2510
Verchina	UKN7	4212.5
Darasuna	RTOF	4580
	RAN4	7312.5
	RSH6	7637.6
	UTWS	10845
	UUS5	10992.4
	UTWS	11623
	UXN5	13725
	RAN4	14095
	UKN7	15805
	UUS5	17120
	RSH6	17265
	UZIN	17610
	RSH6	22800
	UUS5	22985
	UZIN	24832
Zaiarsk	RTVC	2755
	RTVC	4525
	RTVC	16255
	USR4	24730
(Additions)		
Burkan	RIP8	7757.5
	UUOS	7787
	UUOS	9065
	UNRS	14594
	UZQV	15650
	UFOG	19575
Magdatchi	RTKV	6925
Rukhlovo	UXD	3505
	RBJJ	3780
	UXD	4960
	UXD	16525
Tsakir	RTRU	2490
	RTRU	14750
Vitim	UKN	2565
	UKN	2640

LOCATION	CALL LETTERS	FREQ
	UKN	3195
	UKN	4005
	UUN	4115
	UKN	9335
	UWT6	13155
	UVF3	22750
Verchina	RSPM	2425
	RLO6	7817.7
	UZDJ	11496.
	UZCB	11667
	UWEH	15836
	UZDJ	16815
	UWEH	17135
	RLO6	19250
	UFTJ	22960
	UFTJ	24627
Frequencies above 27500 kc		
Irbutsk	RSJ30	292.5
	RSH54	295.5
	RSM30	2266
Kiakhta	RSI67	327
Sretensk	RSK54	327
Ulan Ude	RSH50	218
Coast Stations		
Kharaus Radio	UPD	3180 4140

Aeronautical and Aircraft Stations

(Source: List of Aeronautical and Aircraft Stations, I. T. U. October 1958)

SOUTHEASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Gruznovka Aeradio	UUD	3410 4920 6650	Ust-Kut Aeradio	UUA	3425
Irkutsk Aeradio	UKDI	3485 4880 3995 4840 6490 8460 12720 16870	Vitim Aeradio	UNL	3430 4850 6650
Istok na Baikal Aeradio	UBA6	3365 4940			
Khilok Aeradio	UUB	3410 4990 6650			
Mogotcha Aeradio	UYQ	3455 4840 6525 6650			
Nijne-Udinsk Aeradio	RTQD	3425 4980 6650			
Rukhlovo Aeradio	UXD	3425 4960 6650			
Taitchet Aeradio	UVX	2730 3920			
Tchita Aeradio	UUL	3395 4820 6650			
Ulan-Ude Aeradio	UUM	3455 4860 6650			

Fixed Stations: Frequencies to 27500 kc.

EASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Allaikha	URL6	3572.3	Bolchoi Never (Cont'd)	UFZB	24710
	RTWK	5080			
	RDW6	7617.6	Bulun	UZEL	3183
	UXH5	8123		UOF4	3975
	UBLB	9807.4		UKQ7	4130
	UXY7	10195		RIQ5	5817.4
	UWKC	10595		RTWR	5940
	RBJ6	12214		RAX4	6282.5
	UMI6	14987		RMU9	6912.5
	UXR4	15833		UWUW	7470
Allakh lun	RVWD	2510		RIQ5	7512.5
	RVWD	4065		UBXG	9872.3
Amga	RUF4	1623	Chalaurova Mys	UWTS	10985
	RTWU	2510		UZDQ	12263
	RTWU	4100		UMN6	14716
	RQF8	7517.5			
	UWGM	10173		UGP	11030
	RHR	13562			
	UYG3	16113	Darghylakh	UBJN	65.25
	UWDM	17643		RCH7	1613
	UFRN	22358		ULO	2640
	UZHR	24747		ULO	4005
Bolchoi Never	RVJE	3305		UZNG	8185
	RCI	5150		RFW8	8577.5
	RTJD	5750		RDO6	8697.5
	RQU9	7397.5		RDO6	10535
	RCI	7435		ULO	14835
	UWHC	7470		REW8	20715
	RCI	7700		UZNG	23541
	RCI	8025	Djerdjan	EUS	2625
	RTJD	8525			
	RQX9	9443	Emde Posiolok	UVP	4850
	UFNI	10377		UVP	6885
	UFSX	10952.2		RJB9	9217.5
	RCI	14490		UJD6	10455
	UML6	14693		UJD6	12335
	RCI	15460		RJB9	24260
	UYY6	16107	Iakutsk	RLH8	2767
	RCI	16375.5			
	RCI	17172.5			

Fixed Stations: Frequencies to 27500 kc.

EASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Iakutsk (Cont'd)	RQC8	2832.5	Iakutsk (Cont'd)	RRRK	11075
	UTO	3165		UDA	11080
	RAV	3190		UKI	11120
	UVI	3570		RAV	11455
	RTWQ	3750		RG18	12023
	RKO	4062		RAH	12200
	UTO	4080		RRRK	12320
	RTWO	4100		UDA	12526
	RTWS	4290		RRRK	13630
	RRRK	4500		UMD6	13993
	RTYZ	4525		RAH	14597.5
	RKO	4590		RBZ58	14930
	UVI	4925		RBZ59	15920
	RCO79	5320		RAX	16440
	ROC	5410		UDA	16440
	UTO	6370		ROC	17167.5
	URO1	6370		RAH	17605
	RDC	6785		RAH	18035
	RRRK	6870		RRRK	18060
	RTWQ	6990		RRRK	18190
	RRRK	7320		RRRK	18280
	RRRK	7380		UFKF	18312.6
	RBZ54	7465		RRRK	18340
	RRRK	7550		RAH	19032.5
	ROC78	7555		RAX	19835
	RRRX	7600		RAH	20965
	RCU9	7687.5		RAX	23720
	RRRK	7885	Jigansk	RTZD	3360
	RBE8	7918		UKJ6	4137
	RRRK	8010		RTWF	5940
	RAV	8220		RCF9	12087
	UTO	8390		UUK3	13093
	RKO	8620		UZAX	13607
	RRRK	9140		UMI5	14877
	RRRK	9180		UYB4	15696
	RRRK	9320		USP7	17222.5
	RRRK	9350		UZLP	23704
	RAH	10640	Kazatchie	UFTN	80.3
	ROC	10820		RUT4	4587.3
	RRRK	11025		UFVQ	5937.5
	RRRK	11030		RTWX	5940
	RAV	11040			
	RTYA	11040			

Fixed Stations: Frequencies to 27500 kc.

EASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Kazatchie (Cont'd)	RIW8	7772.6
	RUT4	14975
	UYN4	17276.6
	RIW8	23470
	UBSW	23476
	UFVQ	24095
Kighiliakh	UYX5	3186
	UGL	4120
	UMX4	4423
	RTH6	5317.5
	UGL	8230
	RUS4	11115
	UBJ7	11163
	RUS4	12192.5
Kojevnikova Zaliv	RTZA	8310
	RTZA	12620
	UMH6	13717
	RTZA	16100
	RSN5	16755
	UTWX	19905
	UMH6	20385
	RTZA	22245
Kotelnyi Ostr	UWH7	3680
	UPO	4020
	UMR3	4557.8
	UFMY	5312.5
	UPO	8385
	UZH	9885
	UWVL	11170
	UCO4	13856
	UKQ6	14618
Krest Khaldjai	UVO	3605
	RTXM	3875
	UVO	4960
	RTXM	5330
	RIB8	8612.3
	UWBI	10265
	UWKU	15649
	UWKU	16855

LOCATION	CALL LETTERS	FREQ
Krest Khaldjai (Cont'd)	UFCK	22845
	UFCK	23337
	UWBI	24245
Krest Maior	RTYC	3530
	UKS4	4192.6
	UFDQ	5087.5
	RTL6	5363.2
	UJT4	14507
	UJT4	17095
Nagornyi	UJT4	23150
	RTXT	2510
	RTWN	2540
	RTWN	4065
	UCB4	4316
	RTXT	4525
	RRR9	10577
	UCU6	13814
	UWWQ	17266
	UFLN	19017
	UBGW	19064
	UFWL	19107
	RPO7	19158
	UZCT	20064
	UBIX	22896
Nezametnyi	UZYF	23119
	RTXW	2510
	RTXW	4100
	RBJ	4580
	RWB	5020
	RTXW	5140
	RBJ	5150
	RTWC	5235
	RBJ	7435
	RBJ	7700
	RWB	10285
	RTWC	10470
	RBJ	14490
	RBJ	14667.5
	RBJ	15460
	RBJ	15510
	RWB	17435

Fixed Stations: Frequencies to 27500 kc.

EASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Nijne Kolymsk	RWNN	3807.4	Sredne Kolymsk (Cont'd)	RTWV	5080
	UMQ3	4073		RJT	5755
	UBRO	4247.8		RJT	5880
	UYZ4	4377.4		RJT	7665
	RTWE	5080		RJT	7680
	RFI6	8761		UFRM	9972.3
	UBVP	12266		UTWV	10757.6
	USE6	13723		UZHD	12953
	UCO5	14654		RJT	13110
Nordvik Mys	RGD8	16310		RJT	16322.5
	RPF6	2410		RJT	17185
	RSR9	2435		RJT	19985
	USY	4070	Suntar	RTYY	3600
	UKS5	4322.4		UZDU	3777.6
	UFCB	4957.5		UTH	4190
	USY	8360		RRP6	10117.2
	USTP	9827.6		RDM7	15830
	UZPX	9922.8		UZTU	15996.3
	UWJQ	10742.2		RRP6	18475
	UPC3	11035		RRP6	22675
	RAL8	12236	Tommot	UTM	3180
	UZRO	13623		UBB3	3667.5
	UWBY	14906		UTM	4010
Okhotskii Perevoz	RVWC	2510		UTM	4190
	RVWC	4065		UCS5	4511.6
Olenek	UCL9	4186.5		UTM	6390
	UWKO	13771		REZ9	9263
	UCL9	14318		UCS5	14620
	UKI8	14866		UYM7	17563
	UVW4	15884		RED8	19355
	UFWJ	22764		REZ9	23950
Sangarskaia	RTWJ	3550		UZOO	24429
	RTZH	4900	Ust Maia	RTWD	3870
	RTWJ	7335		RTWD	5330
	RTWJ	12685		RTWD	7410
Sredne Kolymsk	RAZ5	2822.5		RMH8	9127.5
	UZE6	3677.6		UTO6	14327
	UOT5	4078		UFVA	19789
				UCW9	20232
				UZIJ	24222

Fixed Stations: Frequencies to 27500 kc.

EASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Verkhoiansk	UZFT	3657
	RTWI	3715
	UZOJ	3757.1
	RPR6	3847.3
	UKI6	4572.3
	RTWI	5790
	RMV8	6862.5
	RAR7	8032.5
	RUX4	8065.5
	REI9	12273
	UXC4	14749
Viliuisk	RIO5	3550
	UZWY	3747.4
	RSP9	3877.5
	UCT5	4223
	RTZF	4900
	RTWY	4985
	RPJ7	7812.3
	RIO5	8017.5
	UBHL	10813
	RMN9	12282.5
	URL5	14783
	RSF5	15590
Vstretchnyi Ostrov	UGK	3160
	UTXP	3614.6
	UGK1	8245
	UZOK	9905
	UWZC	10162.3
	UBE5	10177
	UTRL	11637
	RMW7	12156
	UFTK	13467
	UYL6	14827.5

LOCATION	CALL LETTERS	FREQ
(Additions)		
Tiksi	UHY	355
	Bukhta	
	RBV	3165
	UHY	3165
	RBV	4180
	RHT7	4861
	RFU9	4896
	RBW	5142
	UFYD	5177.5
	RRU6	12246
	UCF6	13873
	UNA4	14737
(Reported since 3/59)		
Kazatchie	EWC6	90
<hr/>		
Frequencies above 27500 kc		
Iakutsk	EWR	38.1
	EWR	38.5
	EWR	46.1
	EWR	46.25
	RSC25	160.32
	RSG75	263.3
	RSN29	465
	RSO68	5900
Sredne Kolymsk	ERB	39.8
	ERB	47.75
Tiksi Bukhta	ERT	39.6
	EMZ	47.1
	ERT	47.8
	ERT.	57.7

Aeronautical and Aircraft Stations

(Source: List of Aeronautical and Aircraft Stations, I. T. U. October 1958)

EASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Emde	UVP	3430
Posiolok		4850
Aeradio		6650
Iakutsk	UVI	3495
Aeradio		4925
		6565
Kotelnyi	UPO	375
Ostrov		425
Aeradio		454
		500
		530
	UPOI	4020
		4140
		6210
		6450
		8385
Krest-	UVO	3470
Khaldjai		4960
Aeradio		6650
Medvejii	UQO	375
Mys		425
Aeradio		454
		500
		540
	UQOI	3165
		4005
		4140
		6210
		6390
		8225
Oimiakon	UVQ	3370
Aeradio		4820
		6650
Tiksi	UAL	142. 86
Bukhta		375
Aeradio		500

LOCATION	CALL LETTERS	FREQ
Tiksi	UHY	290
Bukhta		355
Aeradio		500
(Cont'd)	UHYI	3165
		4180
		5600
		6465
		8440

Coast Stations

(Source: International Telecommunications List of Coast and Ship Stations, Coast Stations, December 1959)

EASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Chalaurova Mys Radio	UGP	425	Medvezhi Mys Radio	UQO	375
		454			425
	UGP ₁	460	454		
		500	500		
		3040	UQO ₁	3060	
		4140	4050		
		4245	4140		
		5490	6200		
		6210			
		6465			
11030					
Djerdjan Radio	RTYK	2625	Omoloi Radio	UGJ	425
		4050			445
		4140			454
	500				
Yakutsk Radio	UGX	375	Prontchichevoi	UGR	425
		425			440
		454			454
		500			500
Kighiliakh Mys Radio	UGL	400			UGR ₁
		425	4140		
		454	5565		
		500	6210		
	UGL ₁	3140	6250		
		4120			
		4140			
		5685			
		6210			
		6435			
		8230			
Kotelnyi Ostrov Radio	UPO	375	Tiksi Bukhta Radio	UHY	130
		425			454
		454			146. 86
		500			290
		530	355		
			500		
UGO ₁	4020	UHY ₁	3165		
	4140		4180		
	6210		5600		
	6450		6465		
	8385		8440		
		UAL	142. 86		
			375		
		500			
			Ust-Olone- kskoe Radio	RTYL	2625
		4050			
		4140			

Coast Stations

EASTERN SIBERIA

LOCATION	CALL LETTERS	FREQ
Vstretchnyi	UGK	425
Ostrov		435
Radio		454
		500
	UGK ₁	3160
		4095
		4140
		5505
		6160
		6210
		8245

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U.S.S.R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Abramovka	RUS8	1747	Akcha (Cont'd)	RUE7	18385
	RSO6	1783		UMR4	20685
	RTEY	2755		UZGB	25038
	RHA6	8022.3		RNI7	25366
	RCV8	8047.3		UMR4	27040
	UWPZ	10344	Aleksandrovsk Priisk	RTKE	3710
	UFKS	13437			
	UWBB	14687	Aleksandrovsk Sakhalin	RQL5	1737.5
	UWHN	15542.8		RBN9	1901
	RDE9	15590		RHR7	2157
	UWSC	15767		RFM7	2681
	UBR7	16118		EKA	3505
	UBPS	18067.3		EKA	3590
	RHN	20958		UYU	4880
	UFYI	22365		RTEI	5175
	RHN	27415		RRR	5290
Aian	RTLY	3580		RTEL	5825
	RVJD	3620		REN9	6873
	RSH5	5787.7		REY	6955
	RAF4	7782.5		RRR	7935
	UBV5	10212		RRR	7995
	RMA9	12167.5		REY	9310
	UFDT	13372.5		REY	10605
	UWYH	14257		RRR	13730
	UBC6	14822.5		UYC4	13903
	UPD6	16267.2		UWHF	14526
	RNN8	18306		RRR	15742.5
	UFSA	22333		UYZ6	16041.2
	UBIU	24487		RRR	16275
				RRR	20565
Akcha	UKJ5	4147		RRU8	25102
	RTRG	4360		RRR	26640
	RSUJ	7767		UWNV	26663
	UFVY	10517.2	Anadyr	UIF	126.85
	UZHL	12291		RQO9	1749.5
	UZAN	13527		RHZ9	1884
	UTYV	14453		RHD8	2136
	UWDZ	15542.8		RAB5	2582.5
	RSQ5	15570		UKO4	3743
	UYO4	17512		RTHU	4507.5
	UBIY	18282.8			
	UBVC	18342.2			

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Anadyr (Cont'd)	RAA8	4864.6	Billings (Cont'd)	UBQE	25147
	RAI8	5046			
	RTHS	5225	Bira	RTLK	2425
	RJF7	6842		UPV5	7462
	RTHT	7925		RTF8	7622.6
	ROM	9485		UUE6	10177
	ROM	9960		USD6	11496
	RTHU	10405		UKH8	14963
	ROM	11160		RIF8	19204
	UIF	11160		UFUH	23094
	RTHU	11615		UZJM	25266
	UBOT	12113		UWOO	26867.5
	UWIQ	13710	Birobidjan	RTLA	5400
	UEP5	14533		RHY7	7492.7
	UDB7	16035		RBG6	9427.7
	ROM	17400		RTE5	12063
	ROM	24070		RHY7	13985
Arka Nijne Amurskii	RTKL	3285		UOG4	14706
				RTE5	18805
Arkharu	UFLI	48.4		RPT5	19199
	RIP6	3807.4		RBG6	21865
	UWHD	4472.4		UTYS	26408
	UYU	4920	Bitchevaia	RTH7	3177
	UFUZ	5777.3		UCJ5	4247.8
	RBH	10295		RTLM	5870
	RDY9	15480		RQI9	7722.5
	UFEZ	18127.3		UZCQ	9905
	UFQL	18772.8		UWE8	11085
	UBXZ	22339		UFSQ	13513
	UZKY	25366		UTWZ	16342.7
Billings	UQP	88.35		UFWS	18686
	RCJ8	3215.7		RRE6	19038
	UQP	4000		UZRL	25219
	UXG6	4442.4		UZHG	25550
	RLE6	7422.3		UUP3	26332
	UBX5	10962.6	Blagodatnyi Priisk	RVLA	4400
	UUL4	11530		RTBJ	5050
	UKC4	12205		RVLA	5115
	USK7	14272		RTBJ	22380
	UPB3	14812.5			

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Blagodatnyi Priisk (Cont'd)	RTDJ	24280			
Blagovecht- chensk	RBJH	3205	Dalnii		42.85
	RBD	3805			69.1
	RTJW	7400			91.5
	RBD	7610			3560
	RBU9	7647.3			3735
	RBT6	12113			3775
	RBD	13162			3870
	UBM5	14812.5			3880
	RBD	15670			
	RBD	16092.5	Datta	RTBC	4440
	RTA4	18090.5		UUJ3	4447.5
	UBVT	18247.3		UXZ5	10275
	UWVC	26623		UXQ7	14407
				REV9	18870
Bureia	RTJT	2200		UZTV	23713
	UFEM	3192.5		UZS3	26359
	UVJ7	3637.6			
	UMV4	4073	Dzemghi na Amure	RTLv	5025
	RLU9	7552.3		Rll9	8737.5
	RLF7	7825.6		UWUV	11135
	UBLL	10462		RFX9	15750
	UZCO	11147.3		UBHT	18862
	UZJI	12893		RAJ4	19170
	RTD3	19101		UBXP	23629
	UCP5	20346		Uuw7	26803
	UZVZ	24526			
	UTXS	26312.5	Ekaterino Slavka	UBML	56.7
	UCP5	26570		UWO8	3692.4
Chmidta Mys	UOX	375		UGI6	4423
	UOX	3190		UFYV	5327.7
	RDK8	3675		UFCX	6933
	UOX	4230		RPC5	8632.5
	UBOF	5107		RTJC	9435
	UOX	6250		UTXM	13399
	UTYD	10339		UTVD	17213
	UYB6	10865		UBXW	18450.2
	UBTY	13553		UCN6	20804
	UWKI	14558		UBRT	23219
				UPJ5	26462

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U.S.S.R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Ekaterino Slavka	UCN6	27170	Guberoovo (Cont'd)	RRX8	9953
Esso	RTHO	2490		UZRK	10445
	RUI8	3777.6		URQ4	11403
	RTHO	3800		RFS9	18205
	UBU6	10512.4		RUZ9	18347.2
	UTXV	11439		RFS9	19070
	UWKG	13887		UZYU	19975
	UXS7	14720		RUZ9	22220
	UUC4	15636		RFS9	23115
	UBGA	18846		UZRK	23360
	RNW7	19339		UFBG	23389
	UKH7	20332		UZYU	23659
Garovka	RTLX	3505		UVI5	26902
	RTLX	4880	Iman	RCC9	2316
	UFZY	5272.5		RTAJ	2425
	RBX9	8552.6		RTAR	3320
	UZCF	23541		RTAR	4325
Ghijiga	RVJN	4110		RTAJ	4450
	REU	4268		RIH6	8692.5
	REQ7	12162		RQL8	8772.3
	UWUJ	14349		UZO4	11423
	UZPL	19677.6		UJY4	13771
	RRG6	23157		UWAZ	14857
Grodekovo	RTCH	3825		UZQJ	18596
	RTCH	22135		RAM8	18723
Grossevitchi	RTBY	2285		UZQU	19882
	RTBY	4525		RFG6	20310
	RRZ8	5827.3	Imeni Poliny Osipenko	RTKM	4525
	RRZ8	12755		UBOY	5302.8
	RGM	14833		RPJ5	9456
	UFXI	18395.8		UFGN	10522.6
	UZBR	18685		UFBM	11450
	UBH7	19240		UWI8	13803
	UZBR	22500		RQYB	18917
	UZBR	23182		RZH8	19671
Guberoovo	RTAS	4575		UXV5	27482
			Inokentiev-skaia	RNU7	116.7
				RCY7	2344
				UFY	4440
				RFE6	8752

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Inokentiev-skaia	UZJG	9885	Kamenskoe (Cont'd)	UZYV	19868
	UWIO	11170		UKR7	20679
	UFNS	18292.7		UZNS	23467
	UZDX	18981		UZYV	25290
	UZJG	20175	Karaga	RTGO	2010
	UFNS	20720		UOY4	13227
	UZDX	21875		UZR3	15493
	UFY	21995		UZXS	18497.8
	RCY7	22530		UZMT	18552.6
	RFF6	23795		RRM8	19795
				UCG4	20117
Iujno Sakha-linsk	EOY	3635		RPR5	20280
	RAY6	6890		UZWC	23744
	RAYV	9060	Kartun	RVMY	3710
	RAYX	11580		RVMY	4400
	WAYS	13965		RTCK	5050
	RAYX	14675		RNS8	5317.5
	RAYX	17370		RLW9	8717.5
				UZEN	9922.8
Jupanovo	UZXN	3798		UWV7	12967
	RTHM	3800		UXK7	15657
	RSH9	9393		UWHM	18825
	RHI9	12183		RTF5	18951
	UCP4	13737		UGU6	19055
	UWPV	14421		RTF5	20300
	UWJC	15526		UFQR	23376
	UBSL	18157.2	Khabarovsk	RTLE	3275
	RNO9	18921		RWC	3545
	UOB4	20374		RHJ	3600
	UKH6	20672		RHJ	3605
	UOB4	26665		RRRX	3640
Kamenskoe	UFNW	5222.5		RTLK	3645
	RSV	5870		RWC	3660
	RSV	9780		RVL	3745
	RSY	9835		RTLK	3760
	UYV3	11575		RHJ	3830
	RSV	13077.5		RVL	3895
	UWHR	13386		UTN	4140
	UWAX	15503		RTLE	4420
	RSV	16210		RRG	4477
	UBNS	19054			
	RSV	19295			

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ
Khabarovsk (Cont'd)	RTLI	4600
	RVL	4880
	UYZ	4940
	RTLU	5025
	EKN	5060
	RYP29	5110
	RTLG	5250
	RTLH	5375
	RVL	5390
	RRRX	5735
	RG078	5769
	RTLF	5775
	RTM	5910
	UTN	6210
	UYZ	6475
	RG079	6780
	RTLK	6780
	RDW72	6830
	RWC	6850
	RVT	6945
	RNW26	7415
	RJY	7475
	RRL	7475
	RNW27	7510
	RRG	7515
	RRG	7565
	RRL	7570
	RBJ8	7632.3
	RRG	7710
	RVT	7735
	RES	7740
	RRL	7792
	RRRJ	7894.5
	RTLL	7900
	RWC	7900
	RSJ5	8182
	RHJ	8190
	RGA	8670
	RRRT	9170
	RRRT	9185
	RTM	9190
	RRRT	9195
	RRRT	9200

LOCATION	CALL LETTERS	FREQ
Khabarovsk (Cont'd)	RTL P	9230
	RVL23	9275
	RRG	9285
	RDW75	9295
	RGA	9375
	RRL	9465
	RRRX	9900
	RRRT	9985
	RTM	9990
	RRRI	10215
	RFL	10220
	RRG	10255
	RRG	10305
	RRL	10310
	RRG	10685
	RKL	10723
	RVI	10825
	RRL	10865
	RVT	10960
	RWC	10965
	RSN22	11650
	RRG	12195
	RWC	12800
	RVT	13022.5
	RSN27	13970
	RVLF	14200
	RGA	14430
	RVT	14450
	UMN5	14737
	RJY	14950
	RRRT	15560
	RTM22	15570
	RRRT	15610
	RRRT	15630
	RRRT	15670
	RRL	15677.5
	RRRT	15690
	RFL	15780
	RWC	15962.5
	RRRI	15970
	RRRI	15980
	RRRI	15990
	RTM24	16010

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Khabarovsk (Cont'd)	RFL	16065	Khabarovsk (Cont'd)	RRRY	18520
	RVT	16116		RRRY	18570
	RRRI	16180		RRRY	18620
	RTM26	16190		RRG	18630
	RRRI	16200		RRRY	18690
	RRRI	16220		RWT21	18720
	RRRI	16230		RRRY	18740
	RRRI	16270		RRL	18955
	RRRI	16290		RFL	19155
	RRRI	16310		RTM	19455
	RRRI	16340		RTM	19535
	RRRI	16350		RFL	19680
	RVT	16365		RZD	19710
	RRRI	16370		RRG	20217.5
	RRRJ	16450		RTM	20265
	RRRI	16450		RZD	20290
	RTM28	17380		RZD	20530
	RRRU	17410		RRG	20655
	RRRU	17420		RZC	20790
	RTM	17425		RFL	20915
	RRRU	17430		RRL	23615
	RRRU	17440		UNL4	26468
	RRRU	17640		RKL	27020
	RRRU	17650	Khanduza	RAD6	2661
	RRRV	17660		RUK9	3337
	RKL39	17670		UTW5	10496
	RRRV	17680		UWCW	11105
	RRRX	18040		UVN7	13430
	RRRX	18080		UYX4	15576
	RRRX	18120		RIS6	16160
	RTM29	18150		UBNY	18732.3
	RRL	18155		UBRW	18937
	RRRX	18180		UBPB	19261
	UFQY	18215.7		UKO6	20144
	RGA56	18230		UZPO	24187
	UFPP	18303.3		UKO6	26395
	RRL	18370	Khody	UGP5	27380
	RRL	18375		USF4	3614.6
	RTM	18380		RTLN	5870
	RRL	18385		RED8	9157.5
	UTP	18390		UBTT	11042.7
	RRRY	18400			
	RRRY	18490			

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

EASTERN U. S. S. R.						
LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ	
Khody (Cont'd)	UNI4	16378	Kitchiga (Cont'd)	UZVJ	23683	
	RZZ8	18623		UOT3	26765	
	UZAJ	24140	Kkhutsin	RTBX	2380	
	UUU5	27441		RQK9	3327. 2	
Khoe	RTEV	2755		RTBX	5200	
	RHN7	3256. 2		RTC9	5282. 5	
	RJN8	9127. 5		UZIZ	9946	
	UWVI	10407. 6		UTRA	11563	
	UVS4	10927		UXM7	13693	
	UMY5	13470		RTC9	18033	
	UST5	15792		UWSJ	18136	
	UZRE	18791		UBNC	18257. 8	
	UFAI	18811		UZDB	18531	
	UZFF	19551		UZJJ	19541	
	UZMX	24241		UZB5	27077	
	UTW6	26562	Kliutchi	RTHB	6275	
	Kikhtchik	UFIZ		107. 25	RPC8	8677. 5
RHR8		4637		RJI8	9377. 5	
RRE7		5232. 7		UTVV	13823	
UUB6		9455		UZOE	18801	
UYR7		10245		RPG7	19390	
UUB6		13917		UBMM	22488	
UZKZ		19580		UFDX	23833	
UMI4		20482	Koliutchinska- ia Guba	UUA3	3180	
RTHC		22280		UTHE	3662. 4	
RHR8		22405		UMM6	3952. 3	
UMI4		23260		UGQ	4105	
UZKZ		23275		RAU7	5021	
UMI4		26990		RTO6	9892. 3	
Kitchiga		UZPH		3792. 3	UJX6	11145
		UFXG		9495	RFR8	12288
		UFXG		9910	UKG6	13762. 5
		UMT6	14843	Korsakov	RAYA	70. 85
		UZVJ	18565		RAYT	7595
		UFXG	18781		UZO5	25015
		UOT3	19510		Komsomolsk na Amure	UIQ
		UWIF	19690	UTG		4140
		UOT3	20476	RYO		4820
		UMT6	20520			
UMT6	20826					

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Komsomolsk na Amure (Cont'd)	RQR23	4920	Korf (Cont'd)	UBQV	19700
	UIQ	4920		RVFA	20880
	RPS52	5080		UOO4	23480
	RYP28	5100		UBQV	23617.5
	RVLD	5125	Kresta Zaliv	UQJ	6265
	RYP	5890			
	RXH	5945	Krutogorovo	RSZ9	5842.5
	UTG	6210		UFNA	11647
	RYJ	6800		RHQ7	12083
	RXH	6965		UBUG	13617
	RXH	7365		UUU4	15474
	RYO	7375		RRD7	18210.6
	RXH	7750		RHQ7	19094
	RYT	9405		UOG5	20461
	RXH	9800	Kuznetsovo	RTSV	2250
	RHD	10140		RTCV	4440
	RPS59	10190	Lavrentia Bukhta	UQQ	4190
	RPL74	10400			
	RYT	10465	Lazo	UFXJ	23
	RYJ	12040		UIT	3530
	RSG51	12090		UIT	4975
	RYZ	13642.5		RCT9	8079
	RXH	13930		UBYB	9827.6
	RWT29	14510		USI4	10985
	RYQ	14558		REW9	12266
	RYP	14560		UCJ8	13753
	RGH	14615		UWCG	16207.8
	RYO	15530		UEJA	22561
	RYT	15570		UZCR	23007
	RYZ	16235	Lukatchek	RTKA	3795
	RYP	18260		RPI7	8092.5
	RYT	18352.5		RPJ9	14785
	RXQ53	18380		UPD3	16247
	RYT	18570		UZLH	18830
	RYP	19615		RPJ9	19196
	RYT	19943.5		RQN8	19370
	RYO	22935		RPI7	20595
	RY5	23830			
Korf	UOO4	14863			
	UFRU	18077.2			
	RUB9	18853			
	RAF9	19380			

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U.S.S.R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Lukatchek (Cont'd)	UZLH	23047	Nikolaevsk na Amure (Cont'd)	RBE5	11137.2
	UPD3	23730		RUL5	12097
Navarin Mys	RHM9	2267.5		UZML	13797
	RQJ8	2390		UFQB	19277
	RPL9	3239		RCQ8	20850
	UWHU	3563		UZX6	26882.5
	RTF9	4950	Nikolskoe	RDG6	4790
	RRU9	5357.4	Ostr	UBZV	5442.7
	UGU	6235	Beringa	UVD5	9135
	UWTR	10536		URP6	10570
	UZMZ	13423		UWXO	11027.6
	UKG8	13696		UVA3	11513
	UES6	14887		UTXX	16202.6
	UXF6	25090		UFZT	22917.5
Nelkan	RVKC	4290	Nogliki	RTEM	2325
Nelma	RIB9	2435		RFO7	5462.7
	RTCE	4600		RTEM	5925
	RFC8	4769		RFT5	9032.3
	RAL4	4811		REE9	9362.5
	RLV8	4950		UBKI	9864
	RALY	4985		UYB3	10660
	UWUX	8645		UWTP	11051
	RTR7	9842.6		USK4	12005
	UCL6	10657		UMT4	13654
	UVI6	11027.6		UWEW	14430
	UCL6	12205		RRF7	18907
	UCB7	13783		UFKV	19326
	UTRO	14284		UKB5	20489
	RQA9	20600		UWPH	22801
	UFBL	23138		UKB5	26805
	UWBV	25090	Oblutchie	UWPY	3505
	UWCM	26827		UCV6	4322.4
	RQA9	26945		RTJN	4340
Nikolaevsk na Amure	UXE	3505		UWO	4880
	RTJE	4625		RQZ9	4894
	RTJX	4630		UZCZ	9892.3
	RCA	4765		RDD7	12236
	UXE	4960		RLN8	20730
	RFA7	10717		UZF7	26763

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Okha	RUA7	1766	Opuka (Cont'd)	RTGN	4525
	RHZ8	1911		RSI5	8758
	RHS7	2293		RAE9	12211
	RFP7	2693		UWNQ	16222. 3
	UZU	3550		UFRF	20051
	RTES	3850		RID7	20740
	RAF	4855		RTN4	22541
	RPH9	4906	Palana	RPW8	1769
	RTER	5275		RBV7	2097. 5
	RUB8	8102. 5		UWNU	4052. 9
	RTG3	10157. 3		RVLH	5360
	RFJ6	12147. 5		RMN8	6837
	UKU6	14897		UBIJ	6967. 3
	UBKV	19406		UPC6	8052. 5
	UBQA	22704		UWQO	13507
Okhotsk	RQX7	1776		RPX5	16020
	RSK7	1803		RNI8	18897
	RBQ5	1920		UFRD	19911
	RAQ5	2503		UFRD	25390
	RPA5	2737	Penjino	UAP2	333
	RVLM	3350		UAP3	3995
	RAW4	3386		RTGJ	4625
	RCY9	4964. 3	Petropavlovsk Kamtch	RUR6	1607
	RVLJ	5325		RBT8	1718
	UPF6	14677		RQB5	1853
	URW6	16212. 7		RQD7	2167
	UBLN	19402		RTRV	3305
Olga Bukhta	RCA9	2410		RTGV	3590
	RAH4	3226		EOW	3690
	RAT4	4756		RTGV	4455
	RQG5	4816		RTHX	4525
	RTAF	5100		RRRA	4530
	UWO5	11513		RTHK	4560
	RGL8	12057		RVFW	5060
	UFPX	13386		RRRA	5217
	UUY4	14467		RRRA	5350
	UBNP	19082		RTGX	5360
	UFOV	19371		RTL	5460
	RLT8	20650		RTGU	5785
	USA5	26743		RME7	6777
Opuka	RTGN	2030		REM9	6916
				RRRA	6976

Radio Communication Stations: Frequencies to 27500 kc.

LOCATION	CALL LETTERS	FREQ
Petropavlovsk	RRRA	6977
Kamtch	RTGU	6995
(Cont'd)	RRRA	7324
	RTHX	7325
	RTGY	7350
	RRZ75	7500
	RUO6	7507.3
	RSV5	7837.7
	RAAG	7882.5
	RRRA	8090
	RVFJ	8125
	RTGU	10190
	RTGX	10755
	RTL	10920
	RTGU	11550
	RMR7	12028
	RTL	12135
	RTGK	13480
	UWEQ	13576
	RRRA	13690
	RCG8	15870
	RFM	16002
	RRRA	16160
	RRRA	16170
	RRRA	16260
	RTGU	17510
	RAA6	18097.3
	RRRA	18170
	RRRA	18260
	RRRA	18310
	RTL	23685
	UWOF	26957
Pilenga	RBG7	2261
	RSV8	2842.5
	RPW9	5437.7
	RIB5	7972.3
	UVL3	10126
	UZLY	11676
	UZGL	12142.5
	UWBL	15852.8
	UCU8	20839

EASTERN U. S. S. R.		
LOCATION	CALL LETTERS	FREQ
Pilenga (Cont'd)	RTA9	21837
Plastun	RIS9	2364
Bukhta	RTAT	4440
	USH4	10313
	RGW8	12156
	UKT6	14268
	UBMC	21831
	UZN4	26345
Poghibi	RTEN	2325
	UBQW	3174
	RTEN	5925
	RRC6	10333
	UUQ4	11473
	UZB7	16262.6
	RDF6	18590
	RTO8	19288
	UBQS	21824
Providenia	RHW7	2330
Bukhta	RSH7	2606
	UPB	3160
	RTE6	3275
	UWNC	3605.5
	UPB	4090
	UPB	8245
	UWCD	10326
	UVP4	10783
	UOP5	13743
	UXG4	14917
Pt. Artur		3520
Ptitchii Ostr.	RPZ6	7932.3
	UFYK	18756
	RSC7	19167
	UCP9	19828
	RRG9	20057
	UVZ7	26586
Russkii Ostrov	UMN4	4212.5

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U.S.S.R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Russkii Ostrov (Cont'd)	RQT9	5055	Sovetskaia Gvn.		3520.7
	RTE8	5113			3722.5
	UYV5	6804.5		RTCB	5800
	UWDT	10105		RJS9	6811
	UWU7	10126		RTCA	7370
	UWSW	10685		RTBO	7400
	UVP6	10723		USP4	10757.6
	UCT6	12220		UYX7	13837
Rybnovskii Zvd.				UBQ7	14869
	RTEJ	2000		RR A7	19432
	RTEJ	6375		UZQM	19521
	RAH9	7941.2		UBPW	21761
	UWYE	10806		UBQ7	27184
	UBNF	18357.2	Stoiba		
	UZCH	19512		UZH Y	3752.2
	UFFK	21818		RTCM	3795
	UWEX	26815		UWFG	4372.4
Samarga				UTT5	10726
	UBWJ	31.85		UWFG	15715
	RAD4	1756		UCD7	17085
	RTBZ	2380		RNC8	18931
	RHT9	4828.3		RTCM	19635
	RTBZ	5200		UCD7	20666
	RFP5	7957.6		UCD7	22835
	UPQ5	10326		UWSS	23510
	URA5	12230		RNC8	24165
Serditse Kamen Mys	UBID	26598		UWSS	26917
				UCD7	26980
	RQI7	2895	Svetlaia Bukhta		
	RLV9	3245		RPN7	2357
	RB15	4761		RTCG	5200
	RSH8	4887		UFYY	6877.5
	UCM6	6875		RLH7	7907.5
	RUQ6	7977.7		UFCD	9855
	UZLK	9864		UWWP	10323
	UTZK	10313		UWH8	12220
	UWDJ	14797		UFYA	19137
Sofiiskoe			Tafuin Bukhta		
	UCC6	4057		UWQ8	3662.4
	RLB8	7982.5		RTAW	4525
	UZKN	19498		RHM6	9105.5
	RNC7	21793		UEX5	10385
	UWII	27196		RHM6	13805

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Tafuin	UWMK	18355	Troitsk na	UFMS	19352
Bukhta	UBVB	19291	Amure	UFQZ	19762
(Cont'd)	UWMK	22775	(Cont'd)	UKU4	20326
	UZPT	23967			
	UWMK	26243	Turii Rog	RBN5	3316.6
Tavaiza	RDU9	3399		RTAE	3825
	RTAU	4440		UVSW	10843
	UXE6	10355		UTVP	14725
	UWEI	10943		UTYT	15965
	RNK7	12103		UFXB	18927
	UYZ7	13190		UZKW	19335
	UWPB	14346		UFXB	20250
	RAK7	18110		UKF6	20832
	UFZL	23929		UWSV	20845
Tchernychevka	RTAN	2200		UZKW	24326
				UTYT	26535
				UKF6	27230
Ternei	RTCF	5830	Tygda	RTCN	2510
	RMY8	9163		UYP	3530
	UVI7	10447.3		RTKW	3850
	UCH6	13997		RTCN	4525
	RMY8	14305		UYP	4875
	UZMJ	18984		RTKW	7700
	UZMJ	24600		UYP	13745
	UZMJ	24660			
Tetiukhe	UELS	2218	Uelen Dejnev	RHW5	3848
	RTAM	2450	Mys	UPR	4160
	REH7	9122.6		UPR	8260
	UVA5	10339		REJ9	9312.5
	UWCY	11123		RFP	10355
	UFLO	13497		UTT4	10816
	UZLN	23957		RHX5	12033
	UOB3	26120		UZCU	13536
	UML4	26267		UWBA	14567
Troitsk na	RTQ9	5197.2	UKA	RTHR	2350
Amure	UYT	6475		RAC4	2627.5
	UWDE	10437		UBMP	5163
	UTRB	13443		RTHR	5375
	USU5	16397		RJR7	9233
				UZJ7	10622.6
				RUM7	12277.

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
UKA	UZGH	13517	Vankarem	UWYG	10977
(Cont'd)	UWK7	15949. 3	(Cont'd)	UWFH	11623
	UFWX	16746		RTI3	13456
	UQZ	20767		UOR4	14610
				UMF6	14806
Ust Kamtchat-	RBM5	3266		RQU7	15625
ski	RTGW	3325		RQU7	12043
	RTGZ	3850			
	RTD4	5177	Vladimirovo	RTAI	2400
	RTGT	5180	Aleksandrov	RAM6	7355. 5
	RTGI	6875		UEE6	11113
	RRF8	10507		UKF8	14797
	UWA8	11095		RF15	15625
	UVE5	13670		UFDF	18888
	UTS6	14302		UFAL	24823
	UZI6	14947		UPB5	26423
	UWF6	15646			
	UPK3	15944	Vladivostok	UIK	139. 45
	UBLT	18326		RLL9	1617. 5
	UFMG	18437. 6		RUG4	1794
	UMM4	20771		UIK	2250
				RDA7	2532. 5
Ust Niman	RVJC	2095		RBS9	2703
	RFD5	9047. 7		RVU	3505
	RDU7	9938		ENQ	3875
	RVJC	11055		RRRH	3960
	UZG5	11523		UYI	4890
	UZG5	23430		RHC5	4946. 8
	UBZ	27053		RTAC	5075
				RUD51	5400
Ust Urgal	RBJN	2095		RBS	5845
	UZAU	10903		RVU	6895
	UTEF	20350		RVU	6910
	UGB5	24770		RRRH	7405
	UTEF	27003		RRRH	7410
				RFU	7418. 5
Vankarem	UPA3	3545		RRRS	7442. 3
	UZSC	3737		RTH	7485
	UAV	4130		RVU	7657. 5
	UCA6	4223		RPO6	7677. 3
	UAV1	6310		RRRS	7725
	RID5	7392. 3		RBS2	7965
	UWIH	10155		RRRS	9365

Radio Communication Stations: Frequencies to 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Vladivostok (Cont'd)	RRRS	9370	Vladivostok (Cont'd)	RZA	20790
	RRRS	9385		RZB	20810
	RTH	9875		RVU	23440
	RBS	10120		RTH	23695
	RRRS	10270		RVU	27000
	RRRS	10370	Vorochilov Ussuriisk	UWFM	3160
	RRRH	10390		RTAA	3830
	RUD57	10800		RXG	5305
	UKA	11020		RTCC	6825
	RRRH	11145		RBX5	804. 3
	RUD58	13790		RTCC	9480
	UKOAB	14200		RXG	10610
	RVU	14477. 5		UZMS	11003
	UWQA	14987		RSQ8	12077
	RRRH	15710		RXG	12285
	RRRH	15770		UWVM	14766
	RRRH	15800		RXG	16330
	RRRH	15820		RTL5	18473
	RRRH	15830		UZQW	19664
	RRRH	15850		RXG	19785
	RRRH	15870		UZYB	25484
	RRRH	15920		UWBD	26574
	RRRH	15940		RXG	27010
	RRRH	16021	Vorovskaia Vranghela Ostr	EUG	3750
	RRRS	16345		UWIJ	3501
	RRRS	17370		UMM3	3722. 5
	RRRS	17390		UOQ	4120
	RBS	17490		UOQ	6355
	RTU7	18282. 8		RHO9	7752. 3
	RRRS	18420		UOQ	8260
	RRRS	18510		UJM4	10232. 7
	RTH	18535		UJF4	10975
	RRRS	18580		UZX7	12130
	RRRS	18640	Zarubino Bukhta	UUQ3	13934
	RTH	19385		RTAZ	4525
	RVU	19515		RAV6	3231. 4
	RRRH	19645		RBO8	5036. 7
	RZA	19770		UFZS	5337. 5
	RZA	20210		UPI6	11117
	RVU	20222. 5		UKA5	13723
	RZB	20410			
	RTH	20415			
	RZB70	20470			

Radio Communication Stations: Frequencies to 27500 kc.

			EASTERN U. S. S. R.		
LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Zarubino	RPF8	19320		USI6	11097.7
Bukhta	UBKQ	23247		UCU5	14953
(Cont'd)	UFZW	23782			
	UBKQ	23890			
	USZ7	25030			
	UWM5	26385			
			(Reported since 3/59)		
Zeia	RVJT	3305	Khabarovsk	RZC	20100
	RTJI	3850		RZD	20870
	RTJI	7700	Komsomolsk	RGN	10550
	RTJI	24165	na Amure		
	RFT	24650			
	URR5	24780	Kresta Zaliv	UQJ	4075
(Additions)			Khabarovsk	UWU5	6930
				RTL P	9230
Spassk	RTAB	2300	Piltun	EOY3	117.6
Dalnii	RQZ8	3221	Providenia	UPB	126.85
	RLS9	3391.8	Bukhta		
	UFCO	5402.6			
	UOKS	6818	Tchekunda	UCR5	3955
	RTCD	8020			
	UBUT	10146	Tighil	RTGD	7500
	RTCD	13640			
	UWXG	13747	Uglegorsk	EOY2	115.8
	UWZM	14883			
	RUK4	18056			
	UBIE	18336			
	RTCD	18445			
	RIP7	19179			
Tchetyrekhs- stolbovoi Os.	UOK	395			
	UTXF	3170			
	UFCR	5015			
	UFOA	5187.4			
	UOK	6340			
	UWDA	10465			

Fixed Stations: Frequencies above 27500 kc.

EASTERN U.S.S.R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Aleksandrovsk	RSJ51	75.65	Korsakov	RSH88	326.5
Sakhalinski	RSA89	258.7	(Cont'd)	RSN66	3750
	RSK45	263.5	Krasnogorsk	RSQ22	1542
	RSI47	326	Kuibychevka	RSA92	75.65
	RSL52	403.5	Vostotch	RSJ74	326
	RSE24	969.3		RSN73	405
Anadyr	RSK38	75.85		RSJ84	1037.5
	RSJ46	110.5		RSC48	159.5
	RSB61	220.8	Magedan	RSE26	162
	RSE29	295.5		RSD95	326.5
	RSB86	321		RSM96	2127
	RSO74	411.5	Makarov	RSI35	32.75
Birobidian	RSJ81	251.65	Nevelsk	RSA60	1042
Blagovechtchensk	RSD70	163	Nikolaevsk na Amure	RSJ55	158.5
	RSH33	240		RSA53	320.5
	RSI82	322		RSO61	3505
	RSC41	1007.7	Okha	RSB44	298
	RSO26	2262	Petropavlovsk	RSC90	37.56
Bureia	RSY73	109.5	Kamtch.	RSA28	156.2
Iman	RSJ39	244.6		RSH32	290.7
Iujno Sakhalinsk	RSH49	31.12		RSJ61	324
	RSG71	34		RSN71	375
	RSH40	323.5		RSN35	2538
Khabarovsk	RSH51	74.22	Polarnyi	RSA41	162.8
	RSG91	445.26		RSG86	293
Kholmsk	RSG73	328.5		RSO96	2270
Komsomolsk na Amure	RSG48	161.5	Providenia Bukhta	RSK37	297.5
	RSA93	165.5	Sovetskaia Gvn.	RSH27	31.95
	RSC40	335.6		RSG65	325.5
	RSJ50	1010.89	Spassk Dolnii	RSA90	110
	RSO93	1862			
Korsakov	RSD22	74.49			
	RSJ68	159			

Fixed Stations: Frequencies above 27500 kc.

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ
Spassk Dolnii (Cont'd)	RSD29	162. 8
	RSJ23	1029. 3
	RSO43	2140
Tafuin Bukhta	RTAV	31. 345
Tetiukhe	RSG85	298
Tilitchiki	RSC24	326. 5
Vladivostok	RSH39	38. 5
	RSB67	156. 7
	RSB59	241. 65
	RSK63	291. 5
	RSG54	323
	RSG69	436. 3
	RSJ33	995. 1
Vorochilov Usuriisk	RSA24	75. 95
	RSH83	324. 5
	RSM82	378

LOCATION	CALL LETTERS	FREQ
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Aeronautical and Aircraft Stations.

(Source: List of Aeronautical and Aircraft Stations, I. T. U. October, 1958)

EASTERN U. S. S. R.					
LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Billings U. R. S. S. Aeradio	UQP	375	Lavrentia Bukhta Aeradio (Cont'd)	UQQI	4041
		425			6210
		454			6390
		500			8225
		530			
	UQPI	3195	Lazo Aeradio	UIT	3450
		4020			4975
		4140			6650
		5655			
		6210			
8380					
Chmidta Mys Aeradio	UOX	375	Nijne-Tam- bovsk Aeradio	UYR	3470
		425			4840
		460			6525
		500			6650
		500			
	UOX1	3190	Tchetyrekhs- tols- bovoi Ostrov Aeradio	UOK UOKI	395
		4140			500
		4230			3170
		5565			4075
		6210			4140
6250		5670			
12480	6210				
Kresta Zaliv Aeradio	UQJ	375	Tikhonkaia st. Aera- dio	UHV	3470
		425			4820
		454			6650
		500			
		545			
	UQJ1	3180	Troitsk na Amure Aeradio	UYT	4780
		4020			6475
		4140			6650
		6210			
		6450			
8380					
Lavrentia Bukhta Aeradio	UQQ	375	Tygda Aeradio	UYP	3450
		425			4875
		454			6525
		500			6650
		540			
	UQQ1	3165	Uellen, Dejnev Mys Aeradio	UPR UPR1	310
		4005			435
					500
					3140
					4140
	4160				
	5580				

Aeronautical and Aircraft Stations.

LOCATION	CALL LETTERS	FREQ
Uellen,	UPR₁	6210
Dejnev Mys		6385
Aeradio		8260
(Cont'd)		
Vankarem	UAV	375
Aeradio		420
		454
		500
		530
Vladivostok	UYI	3425
Aeradio		4890
		6500
		6650
Vranghela	UOQ	485
Ostrov		500
Aeradio		

Coast Stations

(Source: International Telecommunications List of Coast and Ship Stations, Coast Stations, December 1959)

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Ayan Radio	RVKD	3165 4110	Chelagski Mys Radio (Cont'd)	UGS UGS ₁	454 500 3130 4105 4140 5520 6190 6210 8200
Aleksandrovsk Sakhalinskii Radio	ULY	375 425 454 464 500 4140 5650 6210	Chmidt Mys Radio	UOX	375 425 460 500 3190 4140 4230 5565 6210 6250 12480
Anadyr Radio	UIF	127 142.86 425 454 475 500 3120 4140 4200 5630 6210 6475 8370 11160	Chubertovo Radio	RVFL	2755 3750
Billings U. S. S. R. Radio	UQP	375 425 454 500 530 3110 4000 4140 6160 6210	Datta Radio	RTBC	3135 4075
	UQP ₁		Dimid Bukhta Radio	UER	4140 5525 6210 6450
Chantary Radio	RVKF	4005	Diomid Bukhta Radio	UWW	5670 6430 8390
Chelagski Mys Radio	UGS	425 430	Koliutshinskaia Guba Radio	UGQ UGQ ₁	452 440 454 500 3180 4105

Coast Stations

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Koliutshins- kaia Guba Radio (Cont'd)	UGQ ₁	4140 6210 6320	Navarin Mys Radio (Cont'd)	UGU ₁	5645 6210 6235
Khorsakov Sakhalinski Radio	UFO UFO ₃	416 6330	Nelma Bukhta	RTBP	4010
Kresta Zaliv Radio	UQJ	375 425 454 500 545	Nikolaevsk Na Amure Radio	ULL	475
	UQJ ₁	3130 4075 4140 6210 6265	Nikolskoe Ostrov Beringa Radio	UEX	400
LaVrentia Bukhta Radio	UQQ	375 425 454 500 540	Nordvik Mys Radio	USY	4070 4140 5660 6210 6400 8360
	UQQ ₁	3130 4140 4190 6210 8275		USY ₁	420 425 454 500
Morozovka Radio	UCM ₁	4440	Okhotsk Radio	RVKG	4050 4110
Mutukhe Bukhta Radio	RTBG	3665 4505	Plastun Bukhta Radio	RTAT	3690
Navarin Mys Radio	UGU	385 425 454 500	Popov Ostrov Radio	RTBB	3065 3665
	UGU ₁	3100 4140	Preobrajenie Bukhta Radio	RTAY	3065 4505
			Providenia Bukhta Radio	UPB	365 425

Coast Stations

EASTERN U. S. S. R.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Providenia	UPB	454	Tazgou	RTBF	3065
Bukhta		500	Bukhta		3665
Radio	UPB ₁	3160	Radio		
(Cont'd)		4090			
		4140	Chetyrekhs-	UOK	395
		5505	tolbovy		500
		6160	Ostrov	UOK ₁	3170
		6210	Radio		4075
		8245			4140
					5670
Ptitchii	UKL	4190			6210
Ostrov		5675			6340
Radio					
Putiatin	RTAX	3065	Tchumikan	RVKE	3165
Ostrov		3665	Radio		4110
Radio					
Rimskii	RTBA	3065	Tetiukhe	UNV	425
Korsakov		3665	Radio		454
Ostrov					500
Radio				UFT	4140
					5650
					6210
Serdts	UGN	425	Uellen	UPR	310
Kamen Mys		454	Dejnev Mys		435
Radio		465	Radio		500
		500		UPR ₁	3140
	UGN ₁	3040			4140
		4140			4160
		4245			5580
		5490			6210
		6210			6385
					8260
Slavianska	UDA ₁	2250	Ust-Kam-	UOS	375
Rybozavod		4525	tchatsk		425
Radio			Radio		454
Tatuin Bakhita	RTAV	3135			500
Radio		4075		RTGI	200
Tavaiza Radio	RTAU	3135	Vankarem	UAV	375
		4075	Radio		

Coast Stations

EASTERN U. S. S. R.

EASTERN U.S.S.

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Vankarem Radio (Cont'd)	UAV	420	Vorovskaya Radio	RVFO	2755
		454			3750
		500	Vranghela Ostrov Radio	UOQ	485
		530			500
	UAV ₁	3020		UOQ ₁	4120
		4130			4140
		4140			5685
		6210			6210
		6310			6355
		8265			8260
Vladivostok Port Radio	UIK ₁	375	<hr/> Special Service Stations: Metrorological bulletins		
		425			
		454			
		500			
	UIK	142. 86	Khabarovsk Radiocenter	RWT	3900
		375		RNW	5100
		425		RTM	8085
		435		RFL	10220
	UFL	454		RFL	10500
		500	Korsakov, Sakhalinski Radio	UFO	416
		4140		UFO3	6350
		5675			
	6210				
	UFL ₁	4140	Vladivostok Port Radio	UIK	142. 86
		5525		UFL2	6310
		6210		UFL2	12500
		8325			
	UFL ₂	6310	<hr/> Notices to Navagation		
		1250			
Vladivostok Radio	RTCX	3190	Aleksandrovs Sakhalinskii Radio	ULY	464
		6440			
	YYL	2250	Korsakov Sekha- linskii Radio	UFO	416
		5550			6350
	UKA	5070	Nikolzevsk na Amure Radio	ULL	475
		8360			
Voyampolk Radio	UKQ ₁	2755			
		3750			

Radio Communication Stations: Frequencies to 27500 kc.

(Note: Because of the unusual number of radio communication stations used for different purposes in this remote area, it seems important they be included in the report.)

(Source: List of Fixed Stations, I. T. U., 31 March 1959)

OSTROV VAYGACH AND POLOSTROV YUGORSKIY 69° N AND 60° W

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Amderma	UPM	8230	Varneka Bukhta	UOB5	4052.9
	UPM	19435		RSY7	7307.3
Greiben Mys	UXB7	4457.2		UWFP	10162.3
	UFBH	5257.5		UWYR	11003
	RBJ9	23555		UOB5	23870
Iarossal Mys	UKD6	4622.7			
	UWAJ	10372.2			
	UTVJ	10867.6			
	USD4	11612.2			
	UWAJ	11980			
Iugorskii- Char Proliv	UCX	139.45			
	RSF8	3256.2			
	RHP6	3337			
	UCX1	4060			
	UCX	8200			
	UZU7	10952.2			
	UZVQ	13567.5			
Karskie Vorota	UCX	129.5			
Karskie Vorota	EVB	4120			
	UQI	6240			
Vaigatch Ostr.	RHN5	2257			
	UCU	3180			
	UCU1	4045			
	UKP6	4175			
	UOP3	4209			
	UCU	6260			
	RIT5	7457.6			
	UPP6	7615			
	UCU	8260			
	RGF8	9327.5			
	UVX6	10195			
	URA4	10992.4			
	UWVV	12130			

Coast Stations

(Source: List of Coast Stations, I. T. U. December 1959)

OSTROV VAYGACH AND POLOSTROV YUGORSKIY 69° AND 60° W

LOCATION	CALL LETTERS	FREQ	LOCATION	CALL LETTERS	FREQ
Amderma Radio	UPM	4060 5615 6175 8230	Varneka Bukhta Radio		500
Iarossal Mys Radio	UIG	415 425 454 500	Amderma Radio	UPM	4060 5615 6175 8230
Iugorskii Char Proliv	UCX	137.9 142.86 300 440 500	Karskie Vorota Aeradio	UQI	375 425 454 500 530
	UCXI	4060 4140 5535 6160 6210 8200		UQII	3140 4120 4140 6210 6240
Karskie Vorota Radio	UQI	375 425 454 500 530	Vaigatch Ostrov Aeradio	UCU UCUI	470 500 3145 4050 4140 5570 6210 6225 8280
	UQII	3140 4120 4140 6210 6240			
Vaigatch Ostrov Radio	UCU UCUI	470 500 3180 4045 4140 5600			
Varneka Bukhta Radio	RDWQ	375 400 425 454			

(Reported since 12/59)

Amderma UPM 139.45

Table 3. Soviet Polar Stations (1 Jan 1956)

Polar stations						
No.	Name	Location	Estab.	N. lat.	E. Long.	Notes
1	Barentsburg	Isfjorden, Vestspitsbergen	1932	78°04'	14°13'	Interrupted 1941-46
2	Piramida	Isfjorden, Vestspitsbergen	1950	78 11	15 08	
3	Nagurskaya	Zemlya Aleksandry Zemlya Fr.-losifa	1952	80 46	46 39	
4	Tikhaya, bukhta	O-v Gurkera, Zemlya Fr.-losifa	1929	80 19	52 48	
5	Malyye Karmakuly	Novaya Zemlya	1877	72 23	52 44	Intermittent to 1896; interrupted 1920-21
6	Stolbovoy, mys	Novaya Zemlya	1934	73 18	53 56	
7	Vykhodnoy, mys	Novaya Zemlya	1934	73 14	56 43	
8	Men'shikova, mys	Novaya Zemlya	1953	70 42	57 36	
9	Rudol'fa, o-v	Zemlya Fr.-losifa	1932	81 44	58 00	Interrupted 1933-36, 1942-47
10	Bolvanskiy Nos, mys	O-v Vaygach	1914	70 27	59 04	Named: Ostrav Vaygach till 1950
11	Khabarovo	Yugorskiy Shar, proliv	1939	69 39	60 25	Transferred from Cape Belyy, Nov. 1942
12	Yugorskiy Shar	Karskoye more	1913	69 49	60 45	

Polar stations

No.	Name	Location	Estab.	N. lat.	E. Long.	Notes
13	Amderma	Karskoye more	1933	69°46'	61°41'	Moved 1 km eastward, 1936
14	Russkaya Gavan', bukhta	Novaya Zemlya	1932	76 14	62 39	
15	Ust'-Kara	Karskoye more	1933	69 15	64 31	
16	Marre-Sale	P-v Yamal	1914	69 43	66 49	Interrupted 1918-20, 1925, 1926-27
17	Kharasovoy, mys	P-v Yamal	1953	71 06	65 45	
18	Zhelaniya, mys	Novaya Zemlya	1931	76 57	68 35	
19	Belyy, ostrov	Karskoye more	1933	73 20	70 02	
20	Drovyanay, mys	Obskaya guba	1932	72 39	72 58	Interrupted 1934-36
21	Kamennyy, mys'	Obskaya guba	1950	68 28	73 36	Arktikproekt Expedition station 1947-
22	Vil'kitskogo, ostrov	Karskoye more	1954	73 31	75 46	
23	Tadibe-Yaga	Obskaya guba	1950	70 22	74 08	
24	Vize, ostrov	Karskoye more	1945	79 30	76 59	
25	Gyda-Yamo	Gydanskiy zaliv	1931	70 55	78 31	Till 1936, in the Yuribey River mouth area
26	Leskina, mys	Yeniseyskiy zaliv	1934	72 21	79 33	
27	Ushakova, ostrov	Karskoye more	1954	80 48	79 15	
28	Diksona, ostrov	Karskoye more	1915	73 30	80 24	

29	Uyedineniya, o-v	Karskoye more	1934	77 30	82 14	
30	Sapochnaya Karga	Yeniseyskiy zaliv	1939	71 53	82 41	
31	"Izvestiy TsIK," ostrova	Karskoye more	1953	77 55	83 00	
32	Karaul	reka Yenisey	1946	70 04	83 13	Until 1953, on Cape Tolstyy Nos
33	Ust'-Yeniseyskiy Port	reka Yenisey	1920	69 39	84 24	
34	Dudinka	reka Yenisey	1906	69 24	86 10	
35	Igarka	reka Yenisey	1929	67 28	86 34	
36	Sterlegava, mys	Karskoye more, Bereg Kharitana Lapteva	1934	75 25	88 54	Interrupted 1944-45
37	Isachenka, ostrov	Karskoye more, O-va Sergeya Kirova	1953	77 13	89 15	
38	Ust'-Tareya	reka Pyasina	1952	73 13	89 47	
39	Kresty Taymyrskiy	reka Pyasina	1939	70 52	89 53	
40	Golamyanny, ostrov	Karskoye more, O-va Sedova	1930	79 33	90 25	Until 1954, on Domashniy Island; has experienced interruptions.
41	Eklips, bukhta	Karskoye more, Bereg Kharitana Lapteva	1948	76 37	91 15	Until 1949, Lomonosova Bay

Polar stations

No.	Name	Location	Estab.	N. lat.	E. Long.	Notes
42	Pravdy, ostrov	Arkhipelag Norden-shel'da	1940	76°16'	94°46'	Interrupted 1943-45
43	Volochanka	reka Kheta	1932	70 58	94 30	
44	Russkiy, ostrov	Arkhipelag Norden-shel'da	1935	77 10	96 25	
45	Tyrtova, ostrov	Arkhipelag Norden-shel'da	1940	76 35	97 31	
46	Krasnoflotskiye astrova	Karskaye more	1953	78 34	98 41	
47	Ust'-Taymyra	Taymyrskiy zaliv	1935	76 12	99 04	Until 1939, Cape Osten-Saken, 7 km distant
48	Taymyr, azero	Poluostrov Taymyr	1943	74 37	101 25	
49	Geyberga, ostrov	Proliv Vil'kitskogo	1951	77 35	101 34	Navigation station 1939-50
50	Khatanga, reka	Khatangskiy zaliv	1932	71 59	102 28	
51	Solnechnaya bukhta	Proliv Vil'kitskogo, o-v Bol'shevik	1951	77 48	104 15	
52	Chelyuskina, mys	Proliv Vil'kitskogo, p-ov Taymyr	1932	77 43	104 17	
53	Zimovochnaya, bukhta	More Laptevskh, Ostrov Faddeya	1953	76 45	106 30	
54	Malyi Taymyr, ostrov	More Laptevskh	1943	78 05	106 49	Navigation station 1942

55	Kosisty, mys	Khatangskiy zaliv	1939	73 40	109 44	
56	Andreya, ostrov	More Laptevykh	1942	76 49	111 10	
57	Ponchishchevoy Marii, bukhta	More Laptevykh	1935	75 34	113 25	Interrupted 1937-47
58	Preobrazhneiya, o-v	More Laptevykh	1934	74 39	112 47	Interrupted 1937-38
59	Ust'-Olenek	Olenekskiy zaliv	1938	72 59	119 49	
60	Taymyr	reka Olenek	1946	72 36	121 55	
61	Dunay, ostrov	More Laptevykh	1953	73 55	124 30	Navigation station 1945-53
62	Stolb, ostrov	reka Lena, del'ta	1953	72 24	126 48	From 1950 Arctic Institute Expedition station
63	Tiksi, bukhta	Guba, Buor-Khaya	1932	71 35	128 55	
64	Tiksi, aeroport	Guba, Buor-Khaya	1955	71 39	128 52	
65	Mostakh, ostrov	Guba, Buor-Khaya	1936	71 33	131 02	
66	Buor-Khaya, mys	More Laptevykh	1953	71 57	132 46	Navigation station, 1935
67	Yudey	reka Yana	1955	71 31	136 25	From 1952, Expedition "Giproarktika station"
68	Ust'-Yansk	reka Yana	1942	70 54	136 20	
69	Temp, bukhta	O-v Kotel'nyy	1949	75 48	137 33	
70	Kotel'nyy ostrov	Novosibirskiy o-va, mys Anisiy	1933	76 00	137 54	Interrupted 1934-35
71	Sannikova, proliv	O-va Kotel'nyy, mys Medvezhiy	1942	74 40	138 55	

Polar stations

No.	Name	Location	Estab.	N. lat.	E. Long.	Notes
72	Kigilyakh, mys	More Laptevykh, O-v Bol'shoy Lyakhovskiy Proliv Dm. Lapteva	1934	73°21'	139°52'	
73	Svyatoy Nos, mys		1952	72 48	140 46	
74	Zemlya Bunge	Novosibirskiy o-va	1953	74 49	142 36	
75	Shalurova, mys	Vostochno-Sibirskoye more, O-v Novaya Sibir'	1928	73 11	143 14	
76	Rozhina, mys	Vostochno-Sibirskoye More, O-v Nov. Sibir	1953	75 03	147 00	
77	Chokurdakh	reka Indigirka	1940	70 37	147 53	
78	Tabor	reka Indigirka	1954	71 15	150 18	
79	Zhokhova, ostrov	O-va De Longa	1955	76 06	153 55	
80	Alazeya	reka Alazeya	1945	70 40	154 00	
81	Genrietty, ostrov	O-va De Longa	1937	77 07	156 35	Transferred in 1947 from Logashkina protoka
82	Kresty-Kolymskiy	reka Kolyma	1940	68 48	161 17	
83	Ambarchik, bukhta	Vostochno-Sibirskoye more	1935	69 34	162 18	Till 1939, on Cape Medvezhiy
84	Chetyrekhshtolbovoy, ostrov	O-va Medvezh'i	1933	70 38	162 24	
85	Rauchua	Vostochno-Sibirskoye more	1940	69 30	166 35	

86	Ayon, ostrov	Vostochno-Sibir- skoye more	1941	69 55	167 58	Navigation station 1939-40
87	Pevek	Chaunskaya guba	1934	69 42	170 16	
88	Apappel'khin	Chaunskaya guba	1948	69 48	170 50	
89	Val'karkay, mys	Vostochno-Sibir- skoye more	1934	70 05	170 56	
90	Billingsa, mys	Proliv Longa	1935	69 53	175 46	Till 1941, on Cape Shelagskiy
91	Gavriila, bukhta	Bering Sea	1935	62 25	179 08	
92	Ugol'naya bukhta	Bering Sea	1935	63 03	179 19	
93	Shmidta, mys	Proliv Longa	1932	68 55	179 29'W.	
94	Somnitel'naya, bukhta	O-v Vrangelya	1954	70 55	179 18	Till 1954, on Cape Navarin
95	Olovyannaya, bukhta	Zaliv Kresta	1935	66 11	179 00	
96	Vrangelya, ostrov	Chukotskoye more bukhta Rodzhersa	1926	70 58	178 32	
97	Vankarem, mys	Chukotskoye more	1934	67 50	175 36	
98	Kolyuchin, ostrov	Chukotskoye more	1934	67 28	174 38	Until 1943, on Cape Dzhenretlen
99	Provideniya, bukhta	Bering Sea	1934	64 26	173 14	Until 1955, on Cape Serdtshe-Kamen', interrupted 1939-43
100	Chaplina, mys	Bering Sea	1937	64 24	172 14	
101	Nettan, mys	Bering Sea	1934	66 57	171 49	

Polar stations

No.	Name	Location	Estab.	N. lat.	E. Long.	Notes
102	Uelen	Bering Strait	1933	66°10'	169°50'	
103	Ratmanova, ostrov	Bering Strait	1940	65 47	169 05	
104	Terpyay-Tumus	Olenekskiy zaliv	1953	73 35	118 40'E.	
105	Khromskaya guba	Vostochno-Sibir- skoye more	1945	72 16	147 06	
106	Shalaurova, ostrov	Vostochno-Sibir- skoye more	1941	69 58	172 34	
107	Blossom, mys	O-v Vrangalya	1952	70 47	179 51	

Problemy Arktiki, vyp. 1, (1957), pp 106-109 (Supplement to M.I. Zotin's paper, "Development of the Network of Polar Stations").

APPENDIX 2
GUIDE TO MAPS

**APPENDIX 2
GUIDE TO MAPS**

A basic impression of the telecommunications facilities and capabilities of the Soviet Union may be gained by perusal of the maps enclosed with this document.

The General Description map shows the major geographic areas into which the Soviet Union may be divided. These are:

European U. S. S. R.

Caucasus

Central Asia

Western Siberia

Southeastern Siberia

Eastern Siberia

Eastern U. S. S. R.

In this map may be found all known Radio Communication Centers, major radio relay lines (planned or operating), new wire communication lines, and line technical centers. (The LTU indicates the presence of important overhead line communications junctions.)

The supporting maps, in larger scale, may be used for more detailed locational information.

Map symbols referring to telecommunications are tabulated on the pages following. The map legend, pertaining to geographic and related data, is included with the maps.

MAP SYMBOLS



Radio communication stations or station groupings in the same location. (Different names are possible.)



Telecommunication stations or frequencies reported after March 31, 1959.



Aeronautical and aircraft stations.

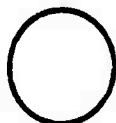


Stations used for maritime purposes.



Special service stations (i.e., time signals, notice to navigation, etc.)

Particulars of the above mentioned stations are taken from the ITU publications.



Radio Communication Centers.



Radio Communication Centers reported more than 10 years ago. (No proof is available concerning present existence.)



Telecommunication weather network (Central Asia only.)



a) Hydrometeorological station



b) Oblast agricultural administration



c) Radio correspondent station

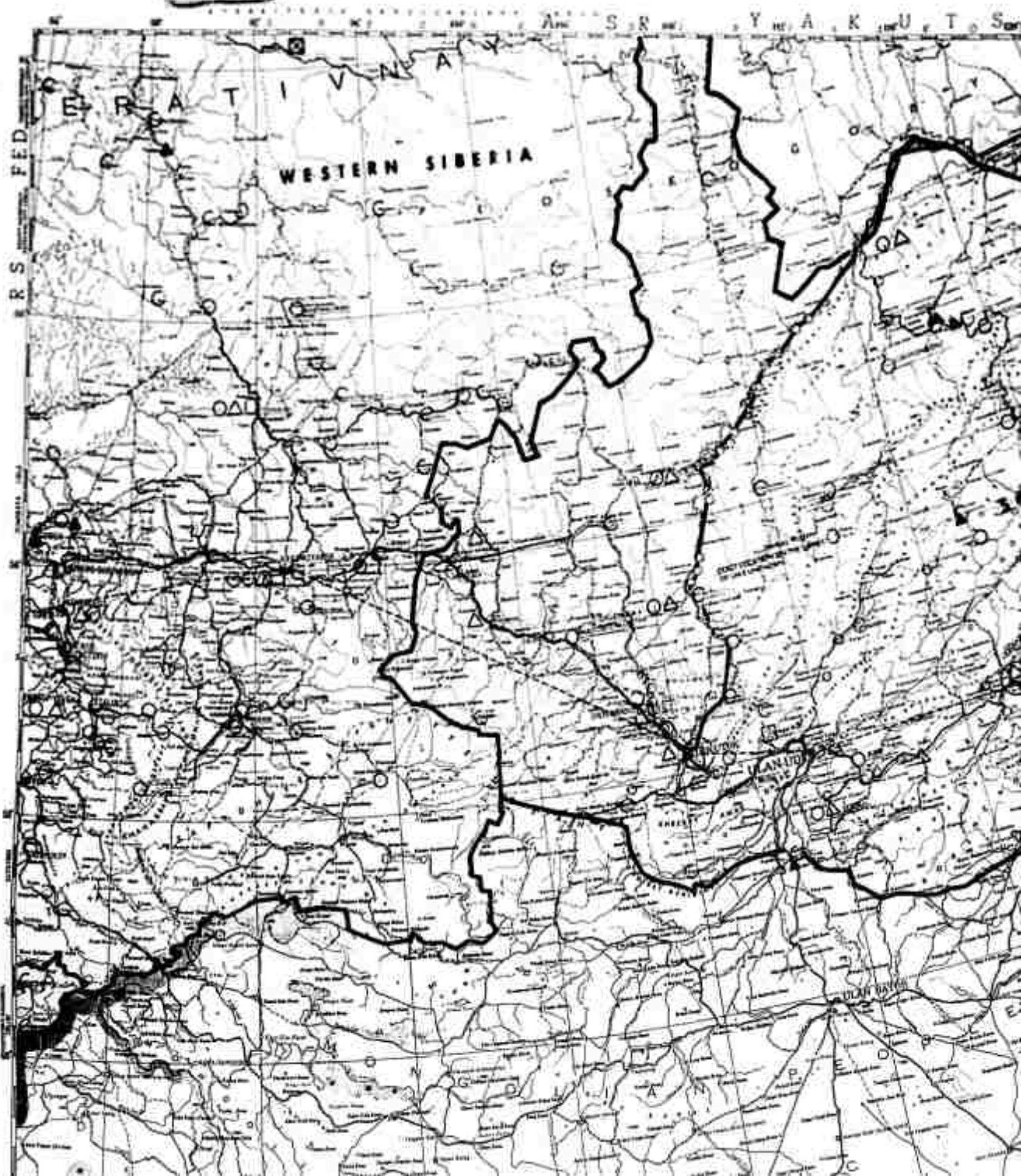


Point-to-point radio communication utilizing ionospheric dispersal.

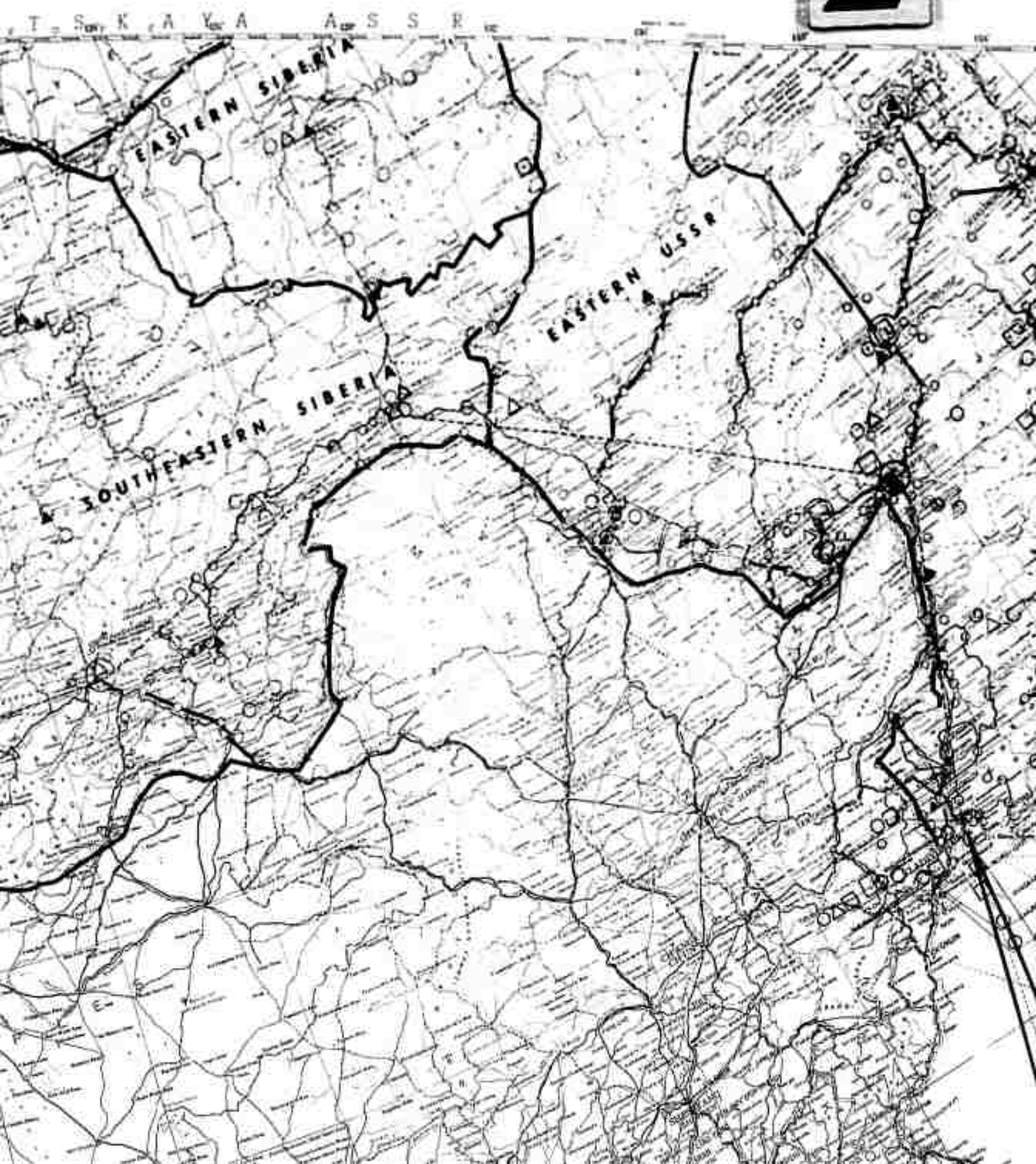


Automatic Telephone Exchange (ATS) to be installed or improved.

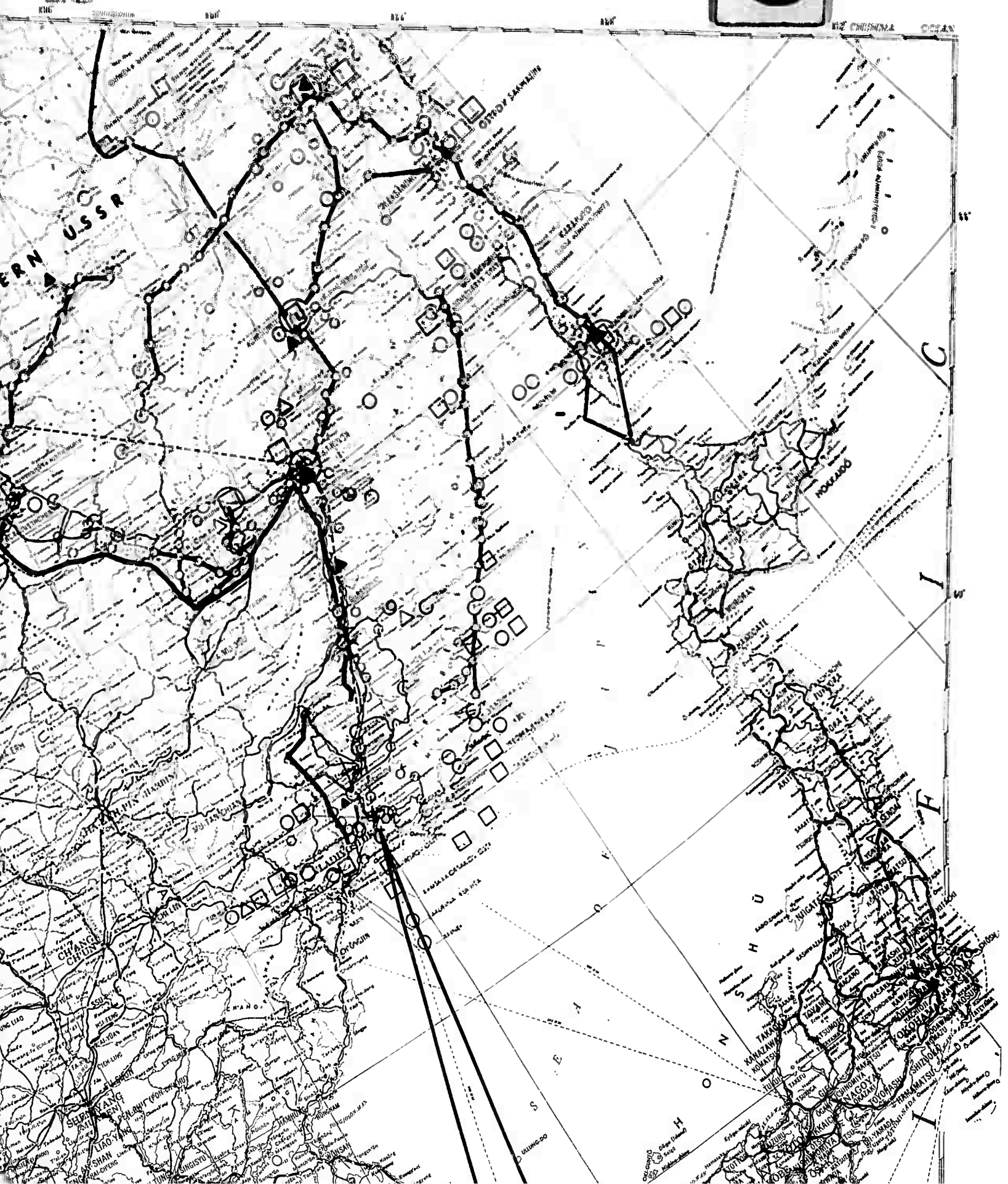
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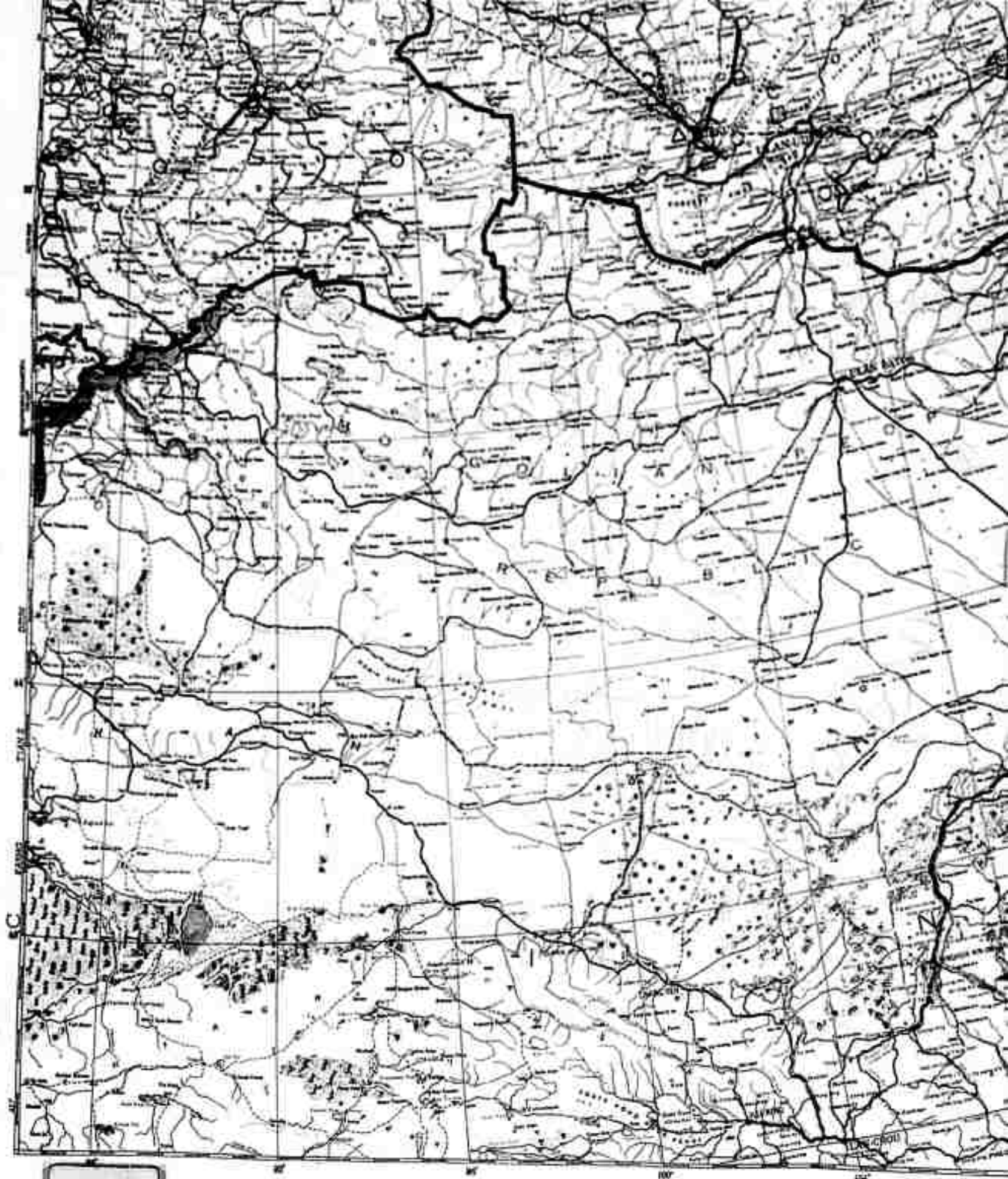


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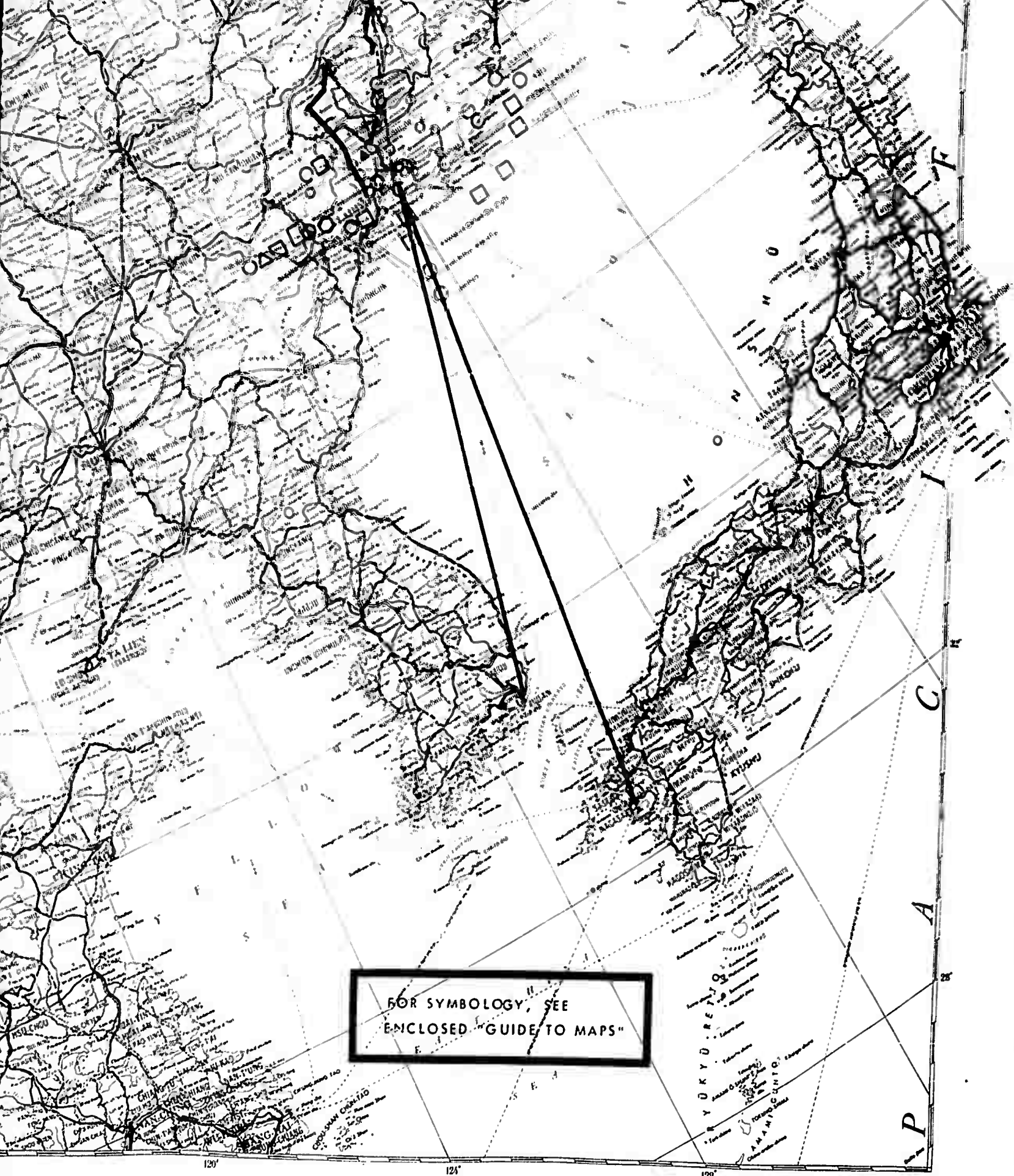


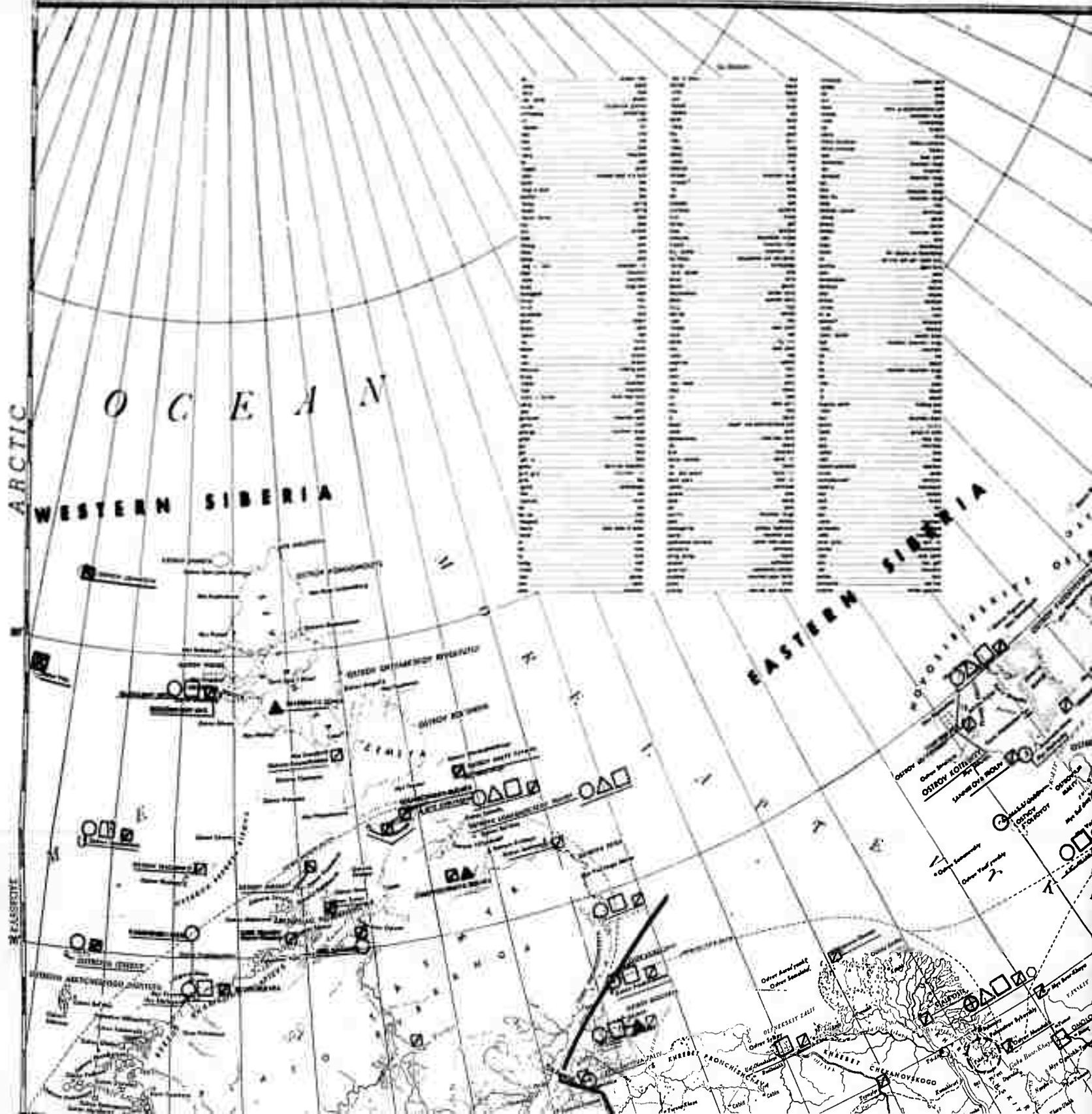
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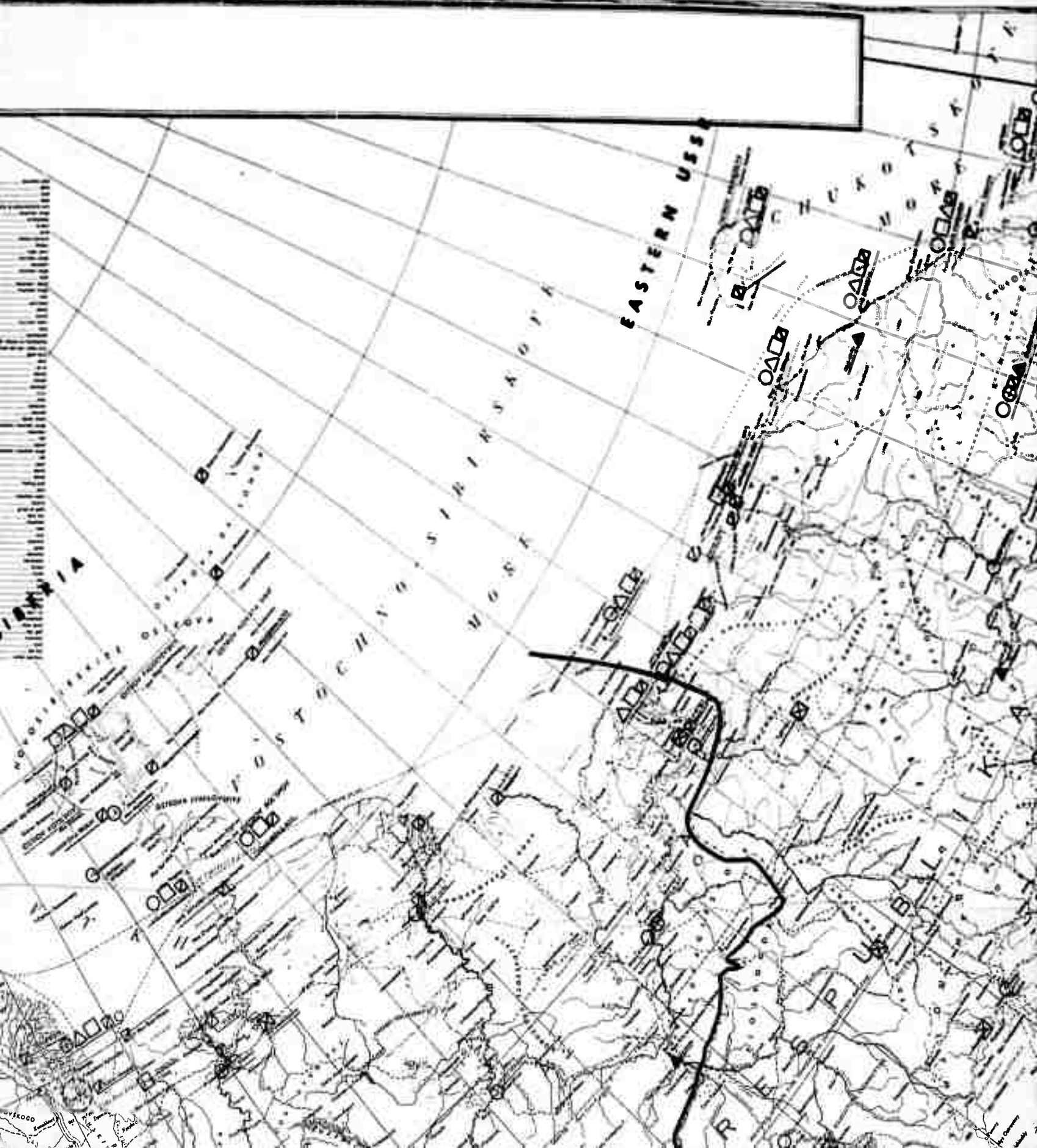


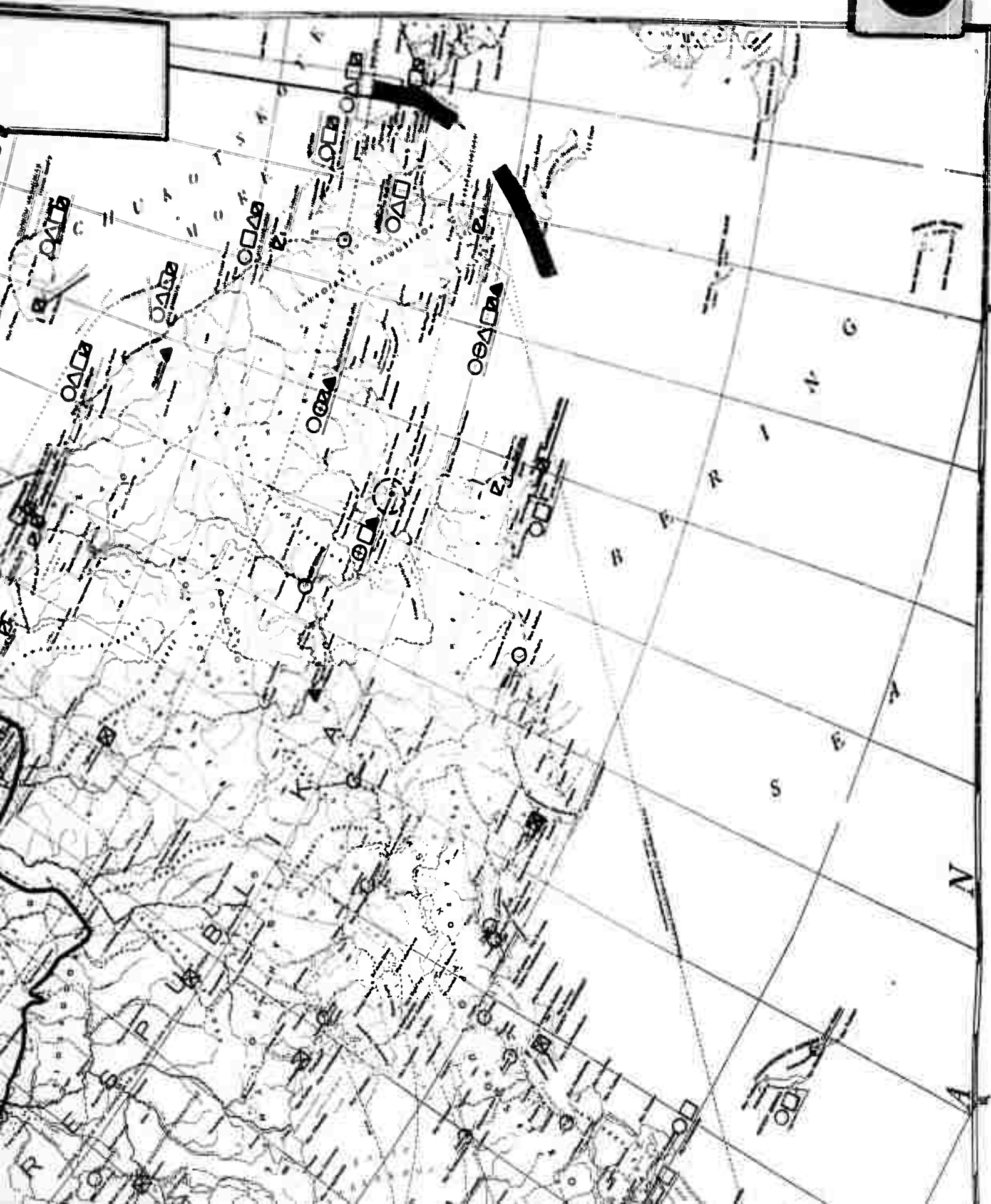
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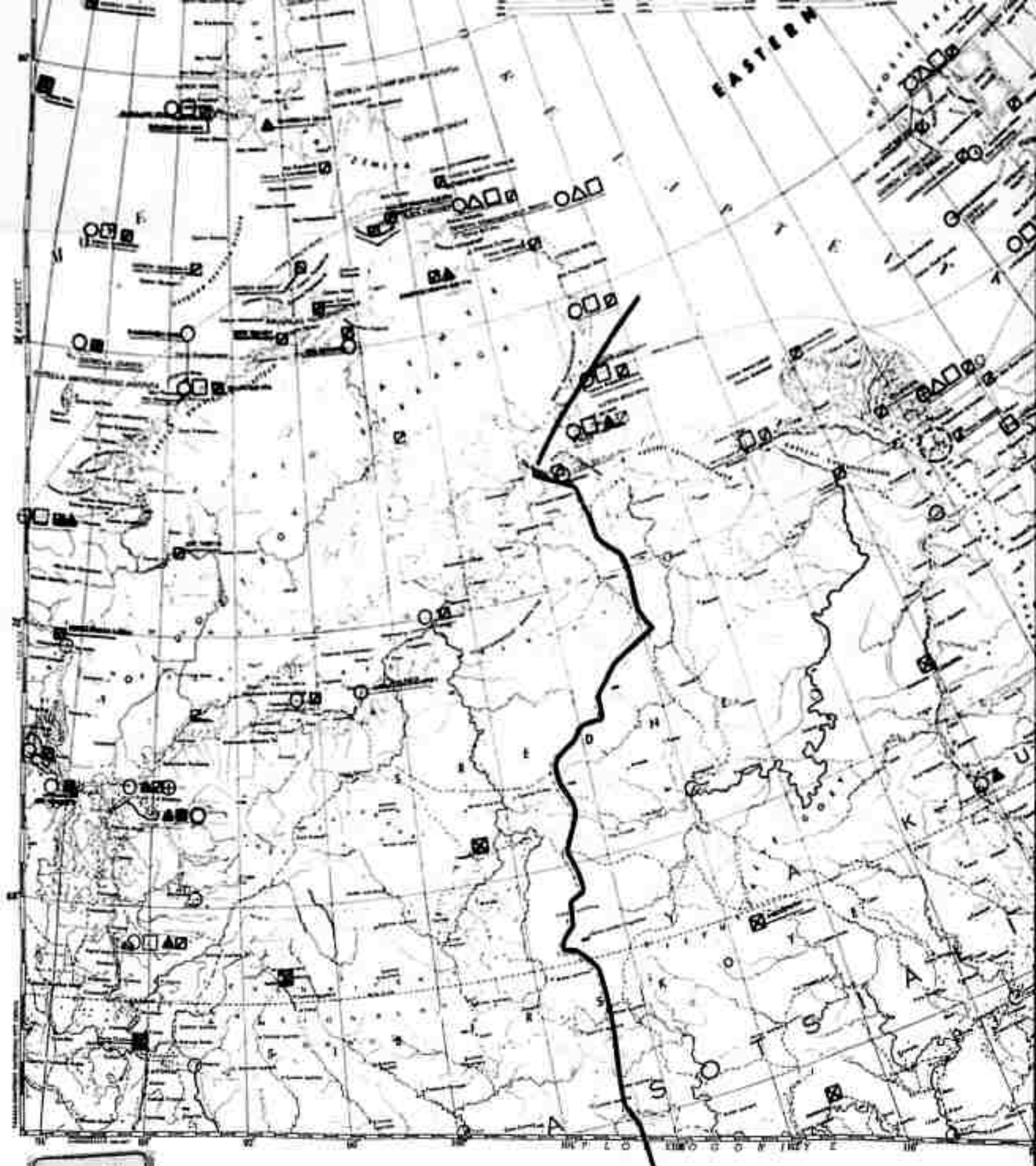


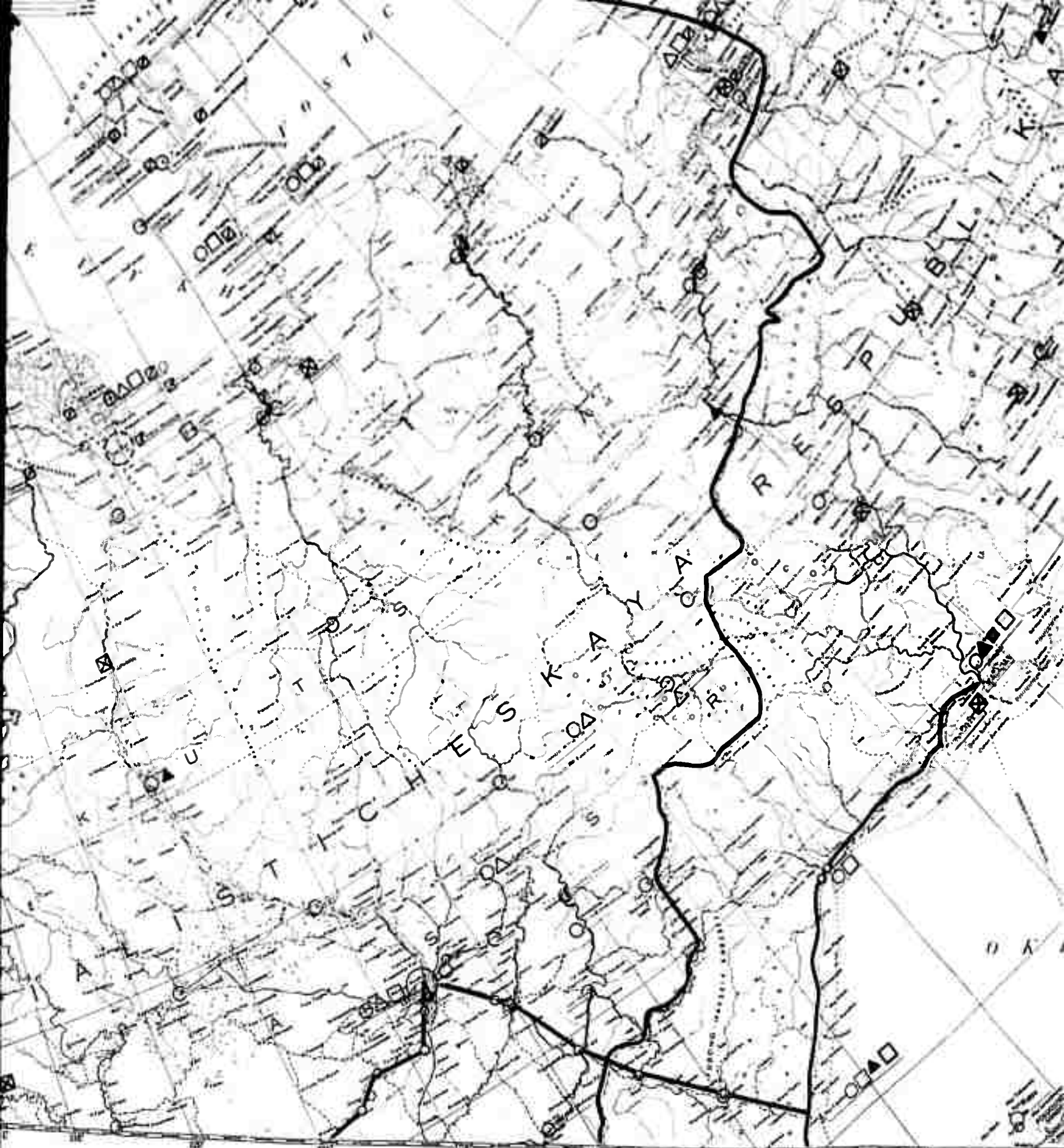


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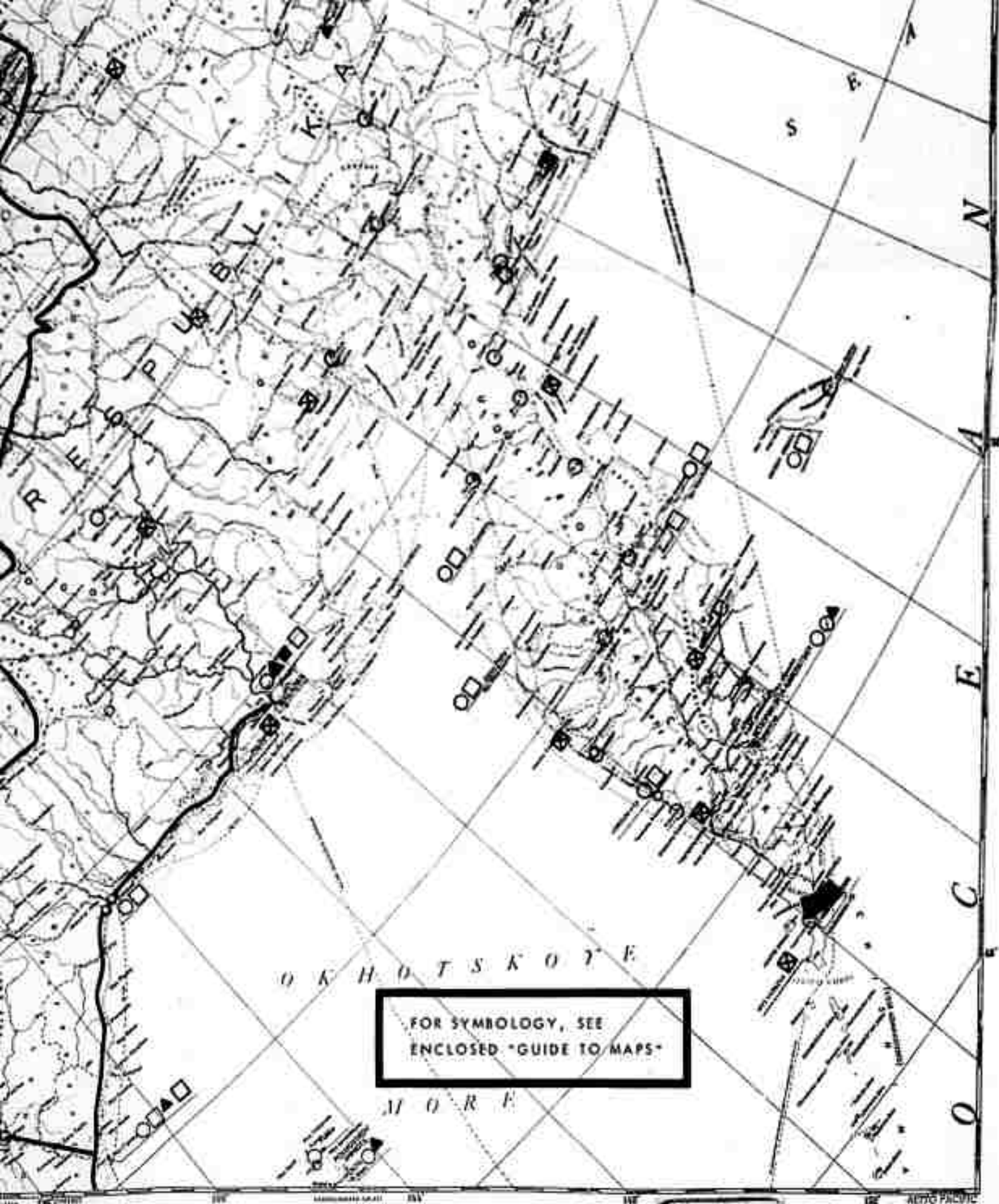








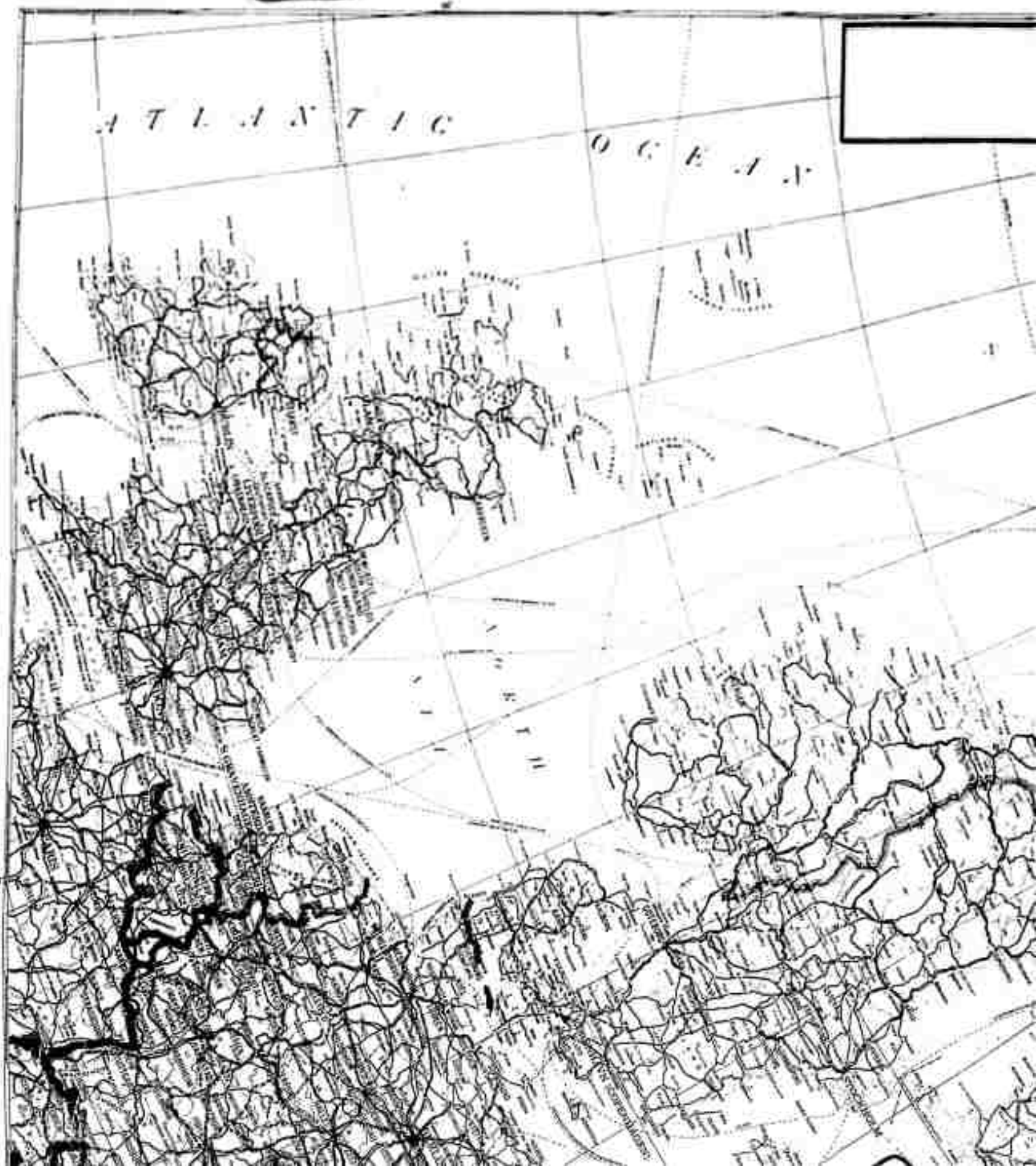
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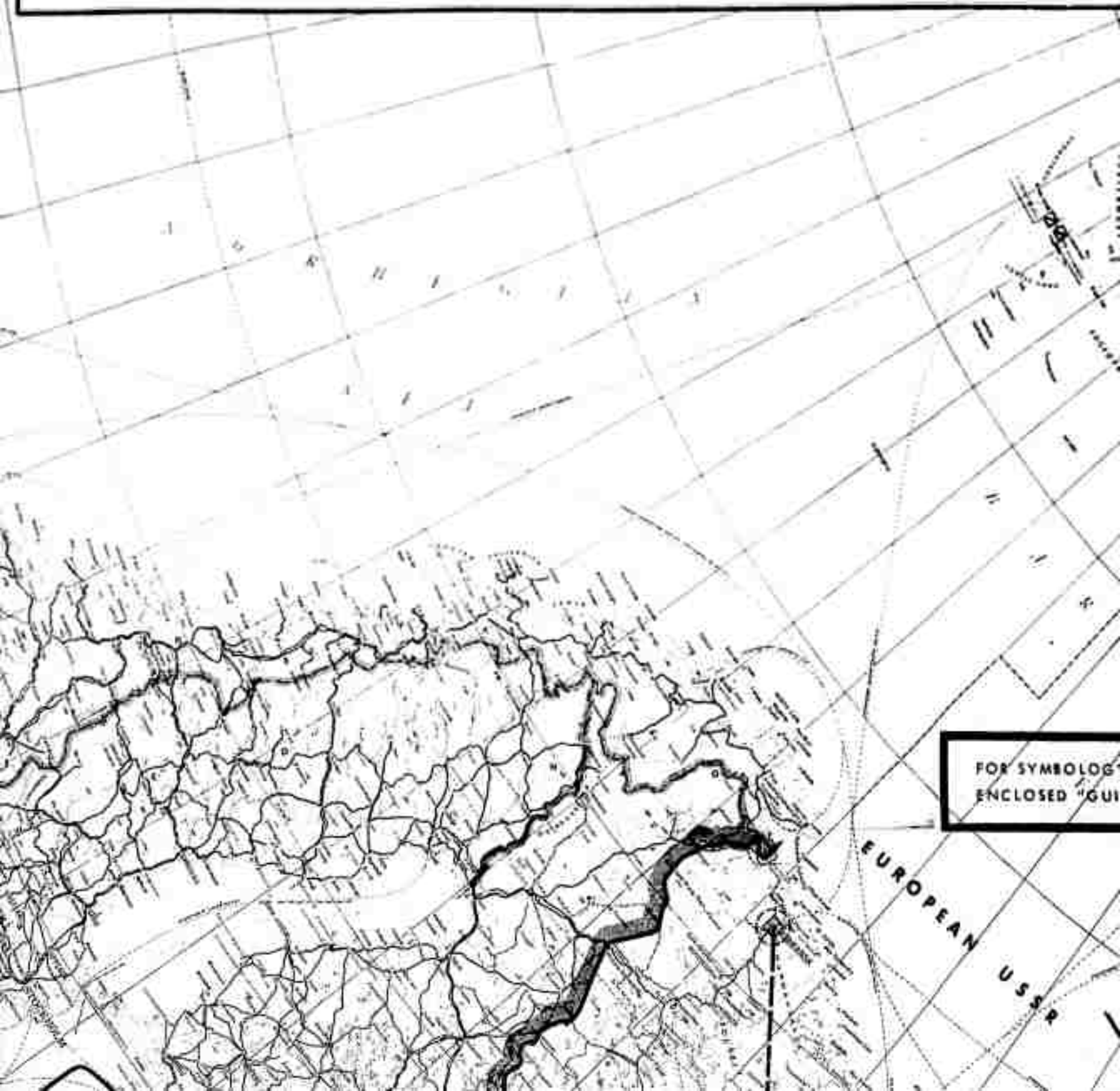
1

A T L A N T I C

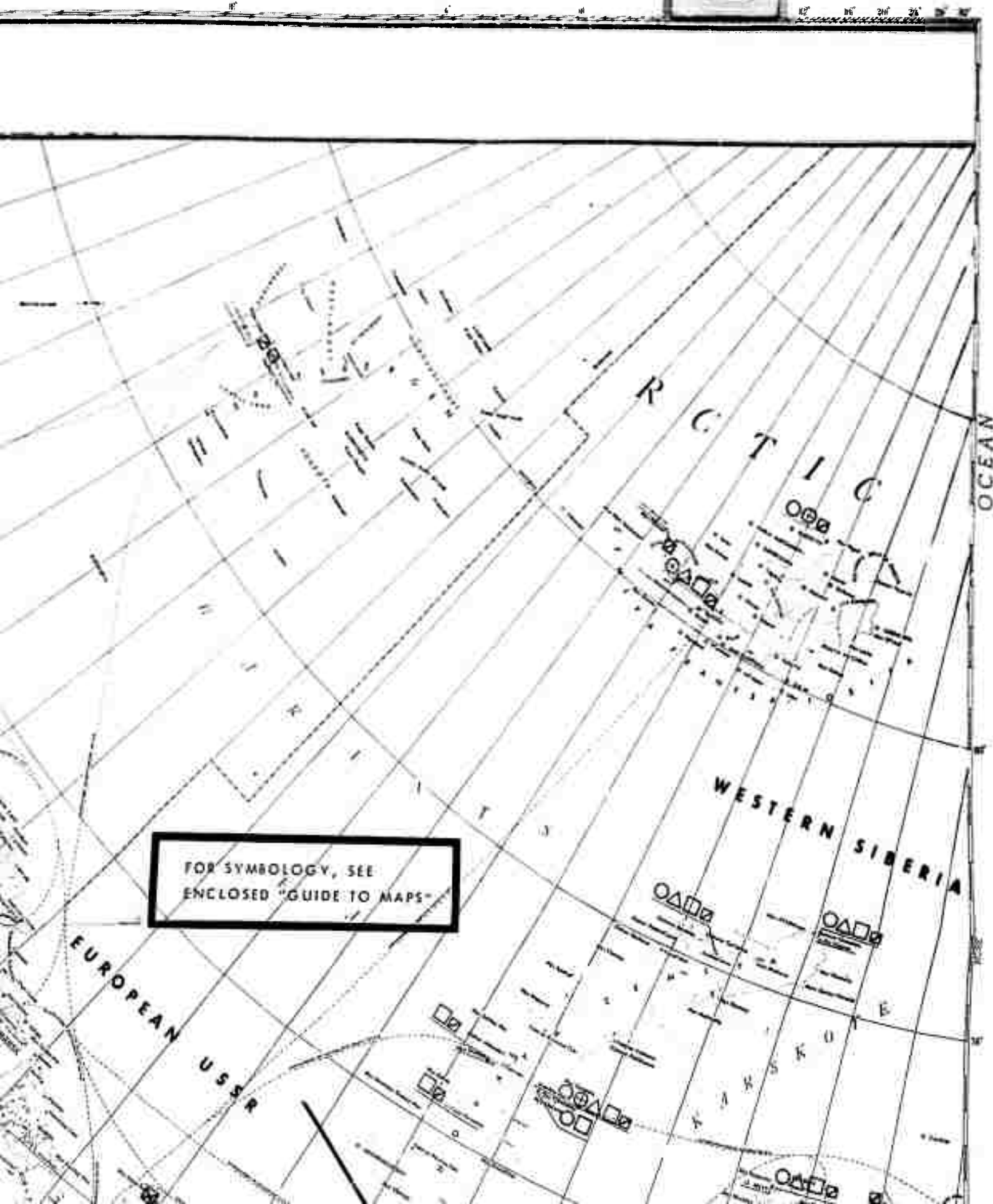
O C E A N

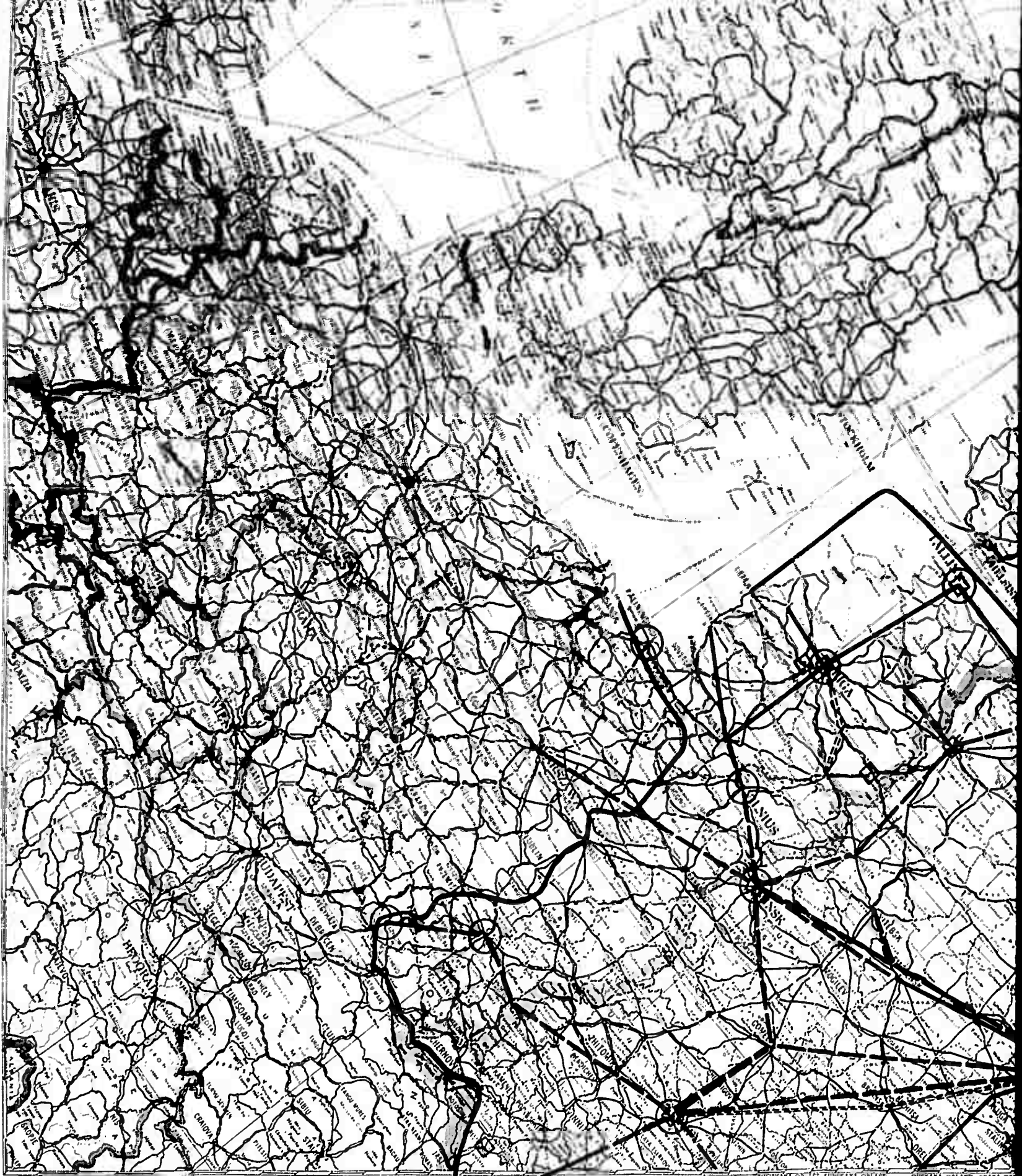


2



3



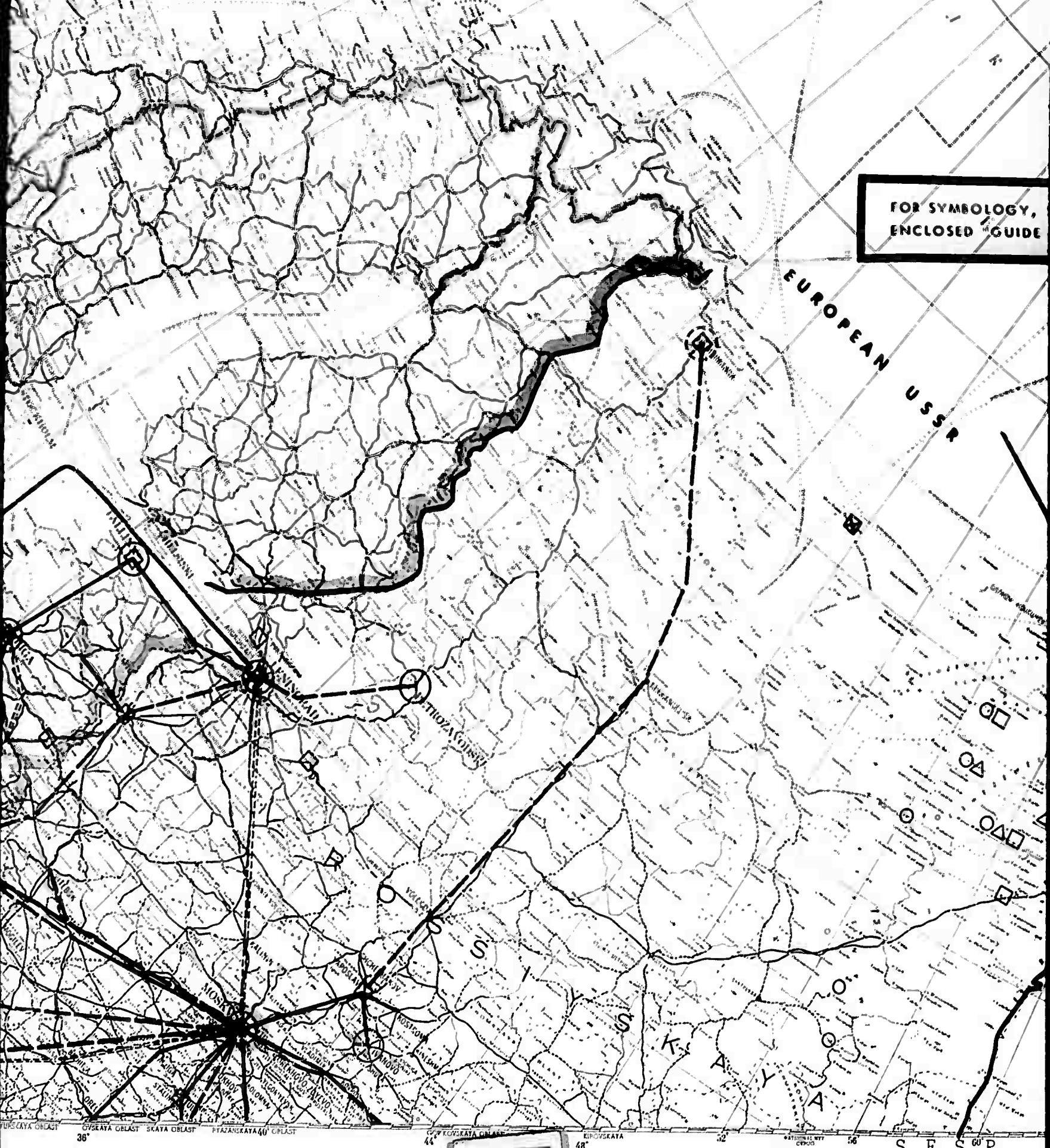


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36°

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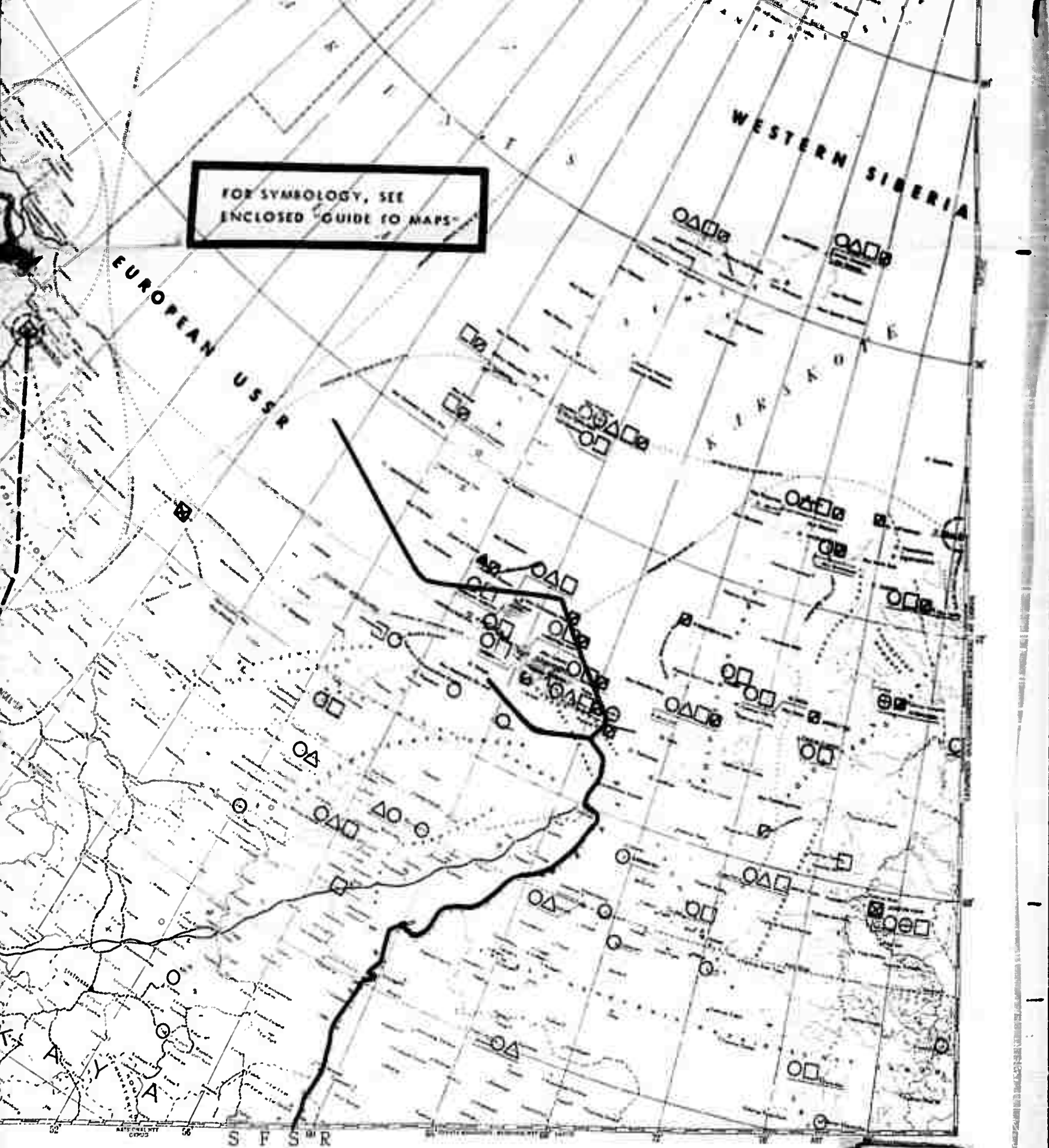
FOR SYMBOLS,
ENCLOSED GUIDE



36° 38° 40° 42° 44° 46° 48° 50° 52° 54° 56° 58° 60° R S F S R

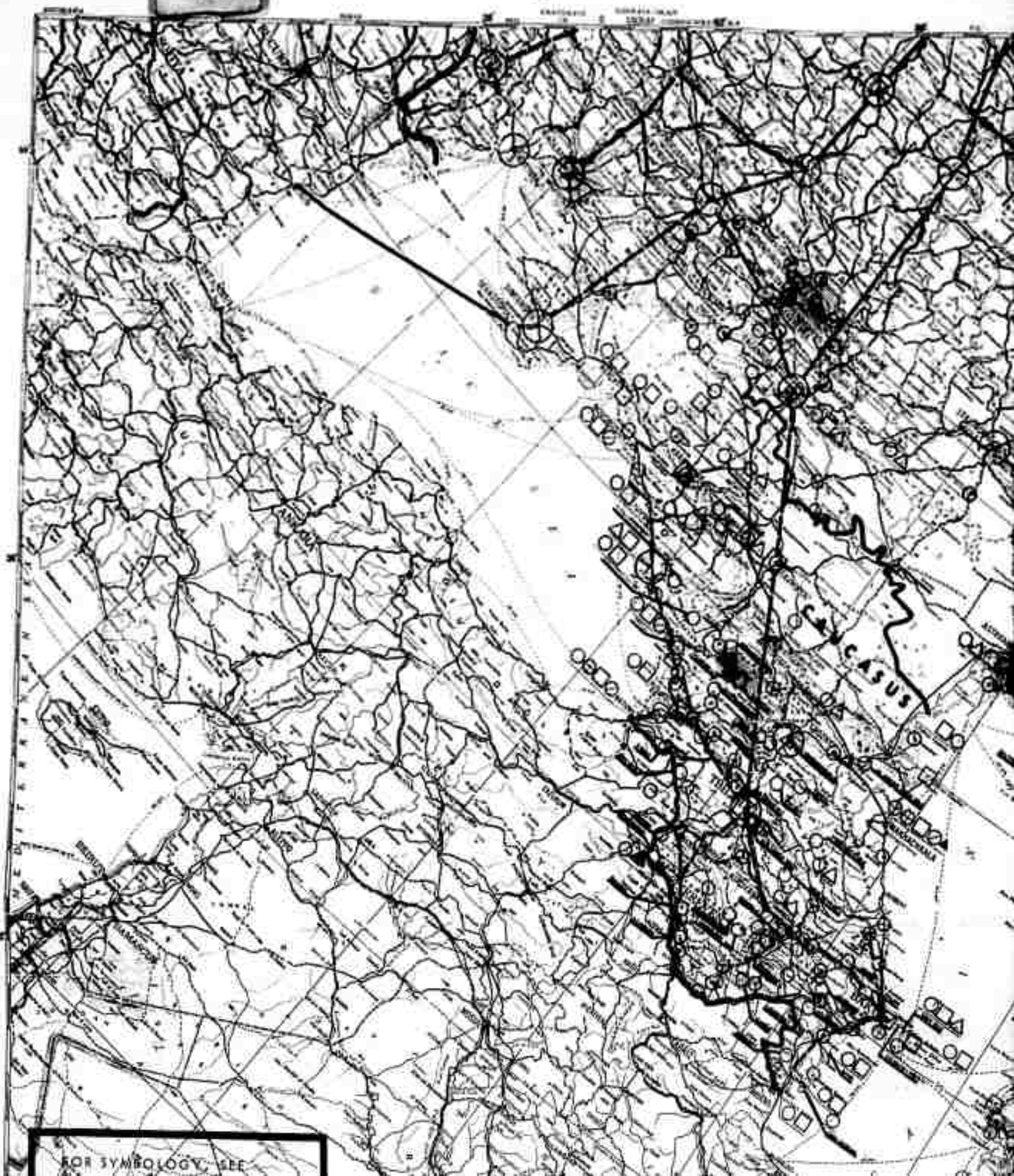
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FOR SYMBOLS, SEE
ENCLOSED "GUIDE TO MAPS"



6

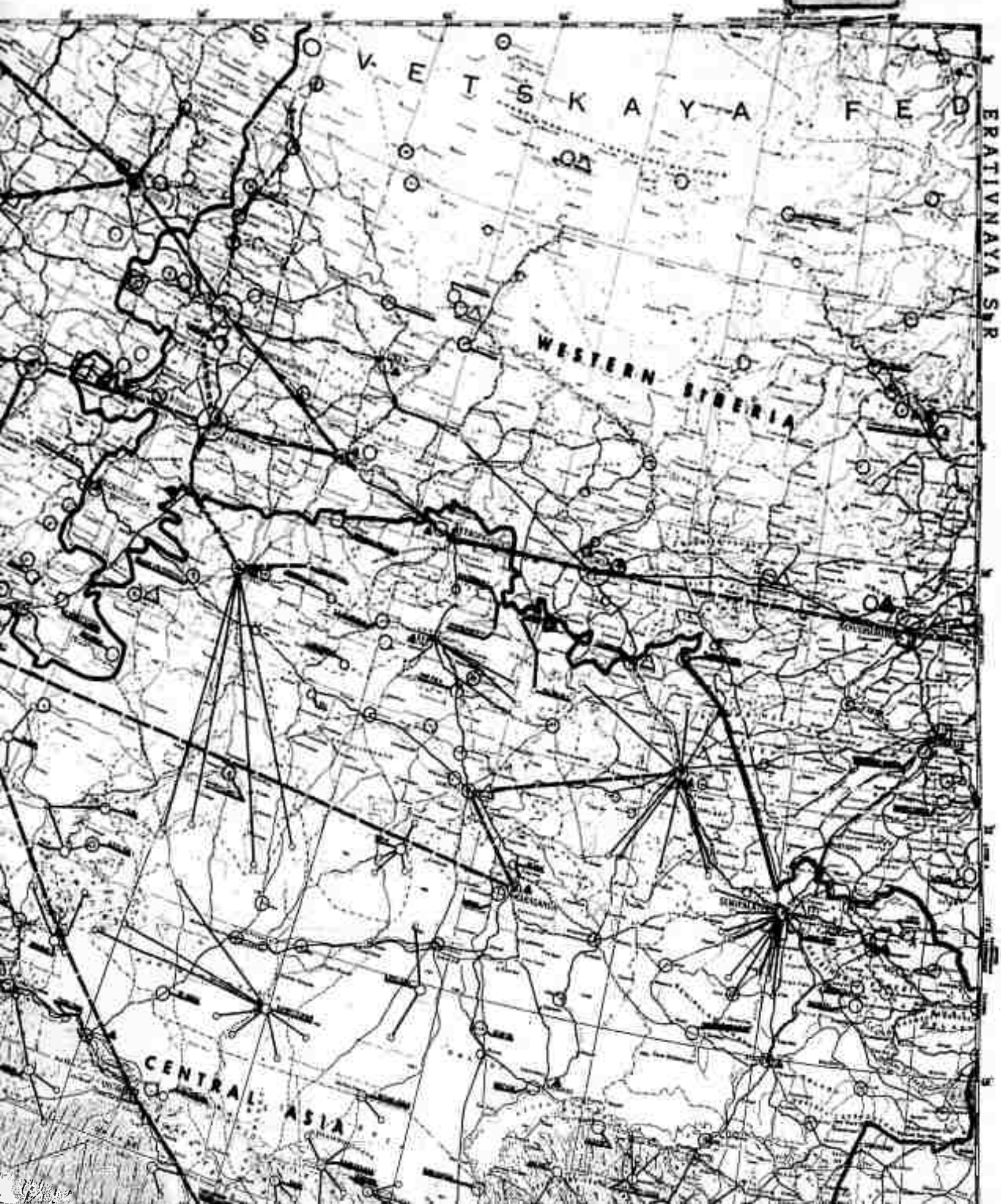
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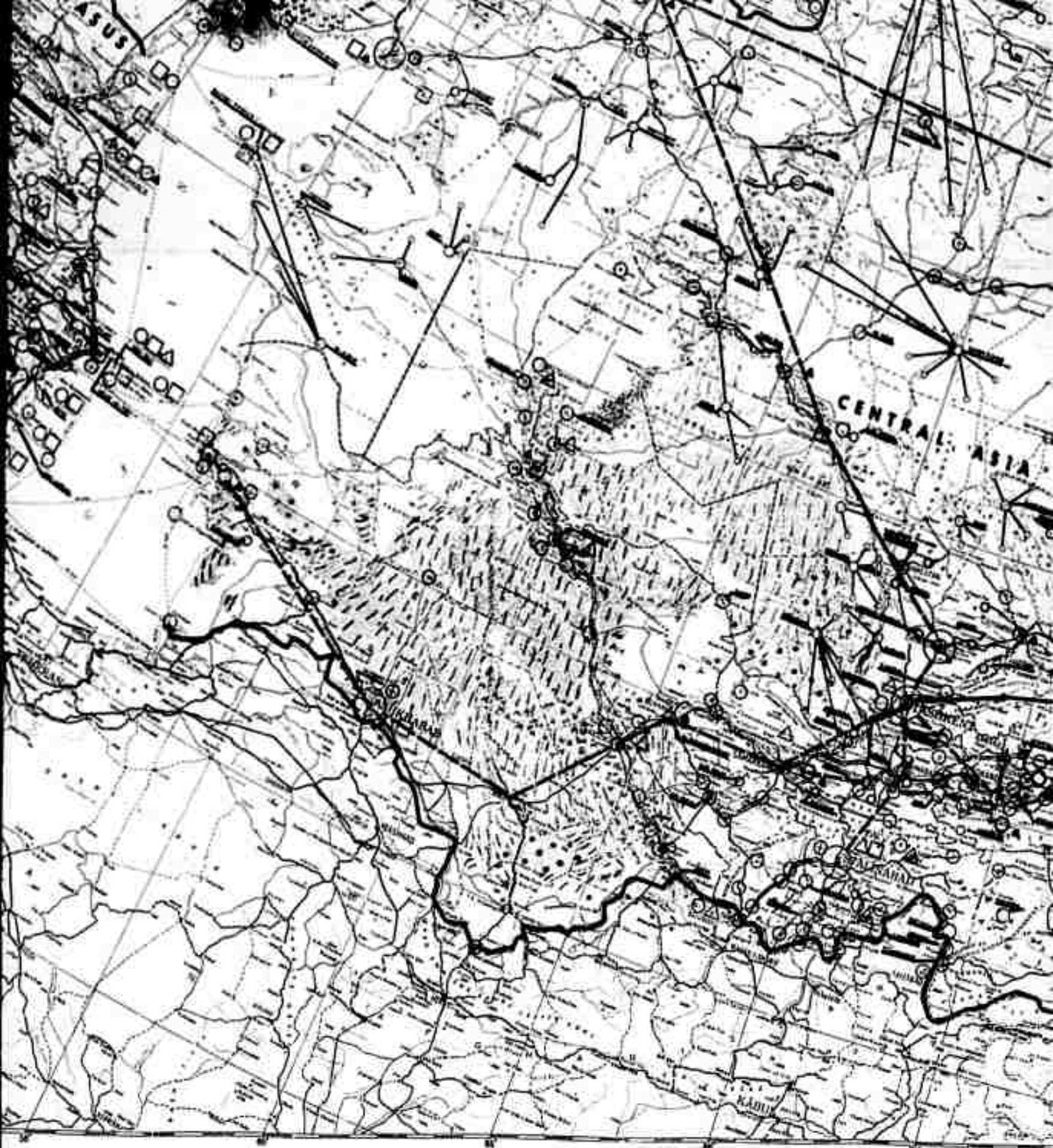
FOR SYMBOLS, SEE

2





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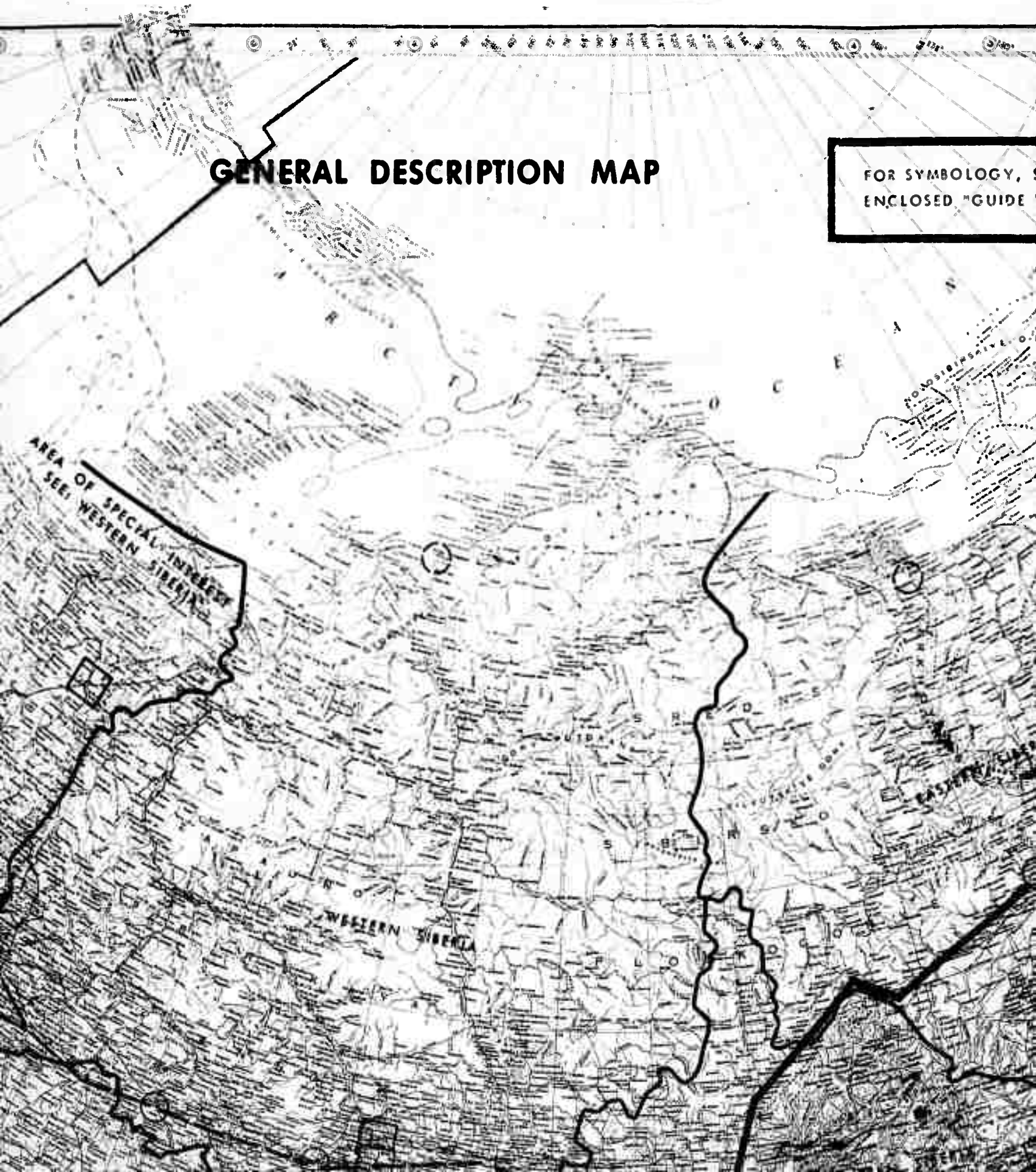
ATLANTIC OCEAN

AREA OF SPECIAL
SEE: WESTERN SIDE

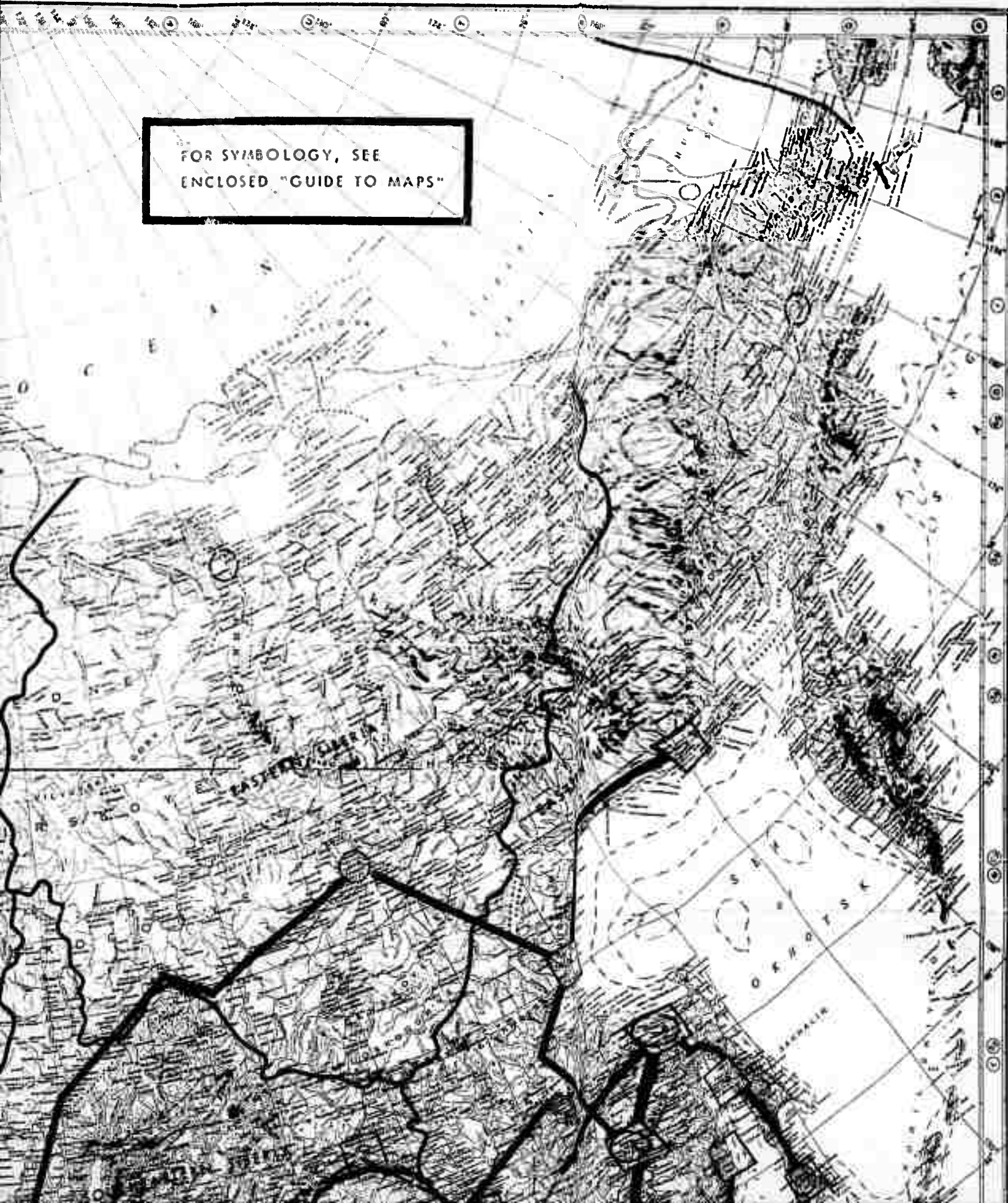


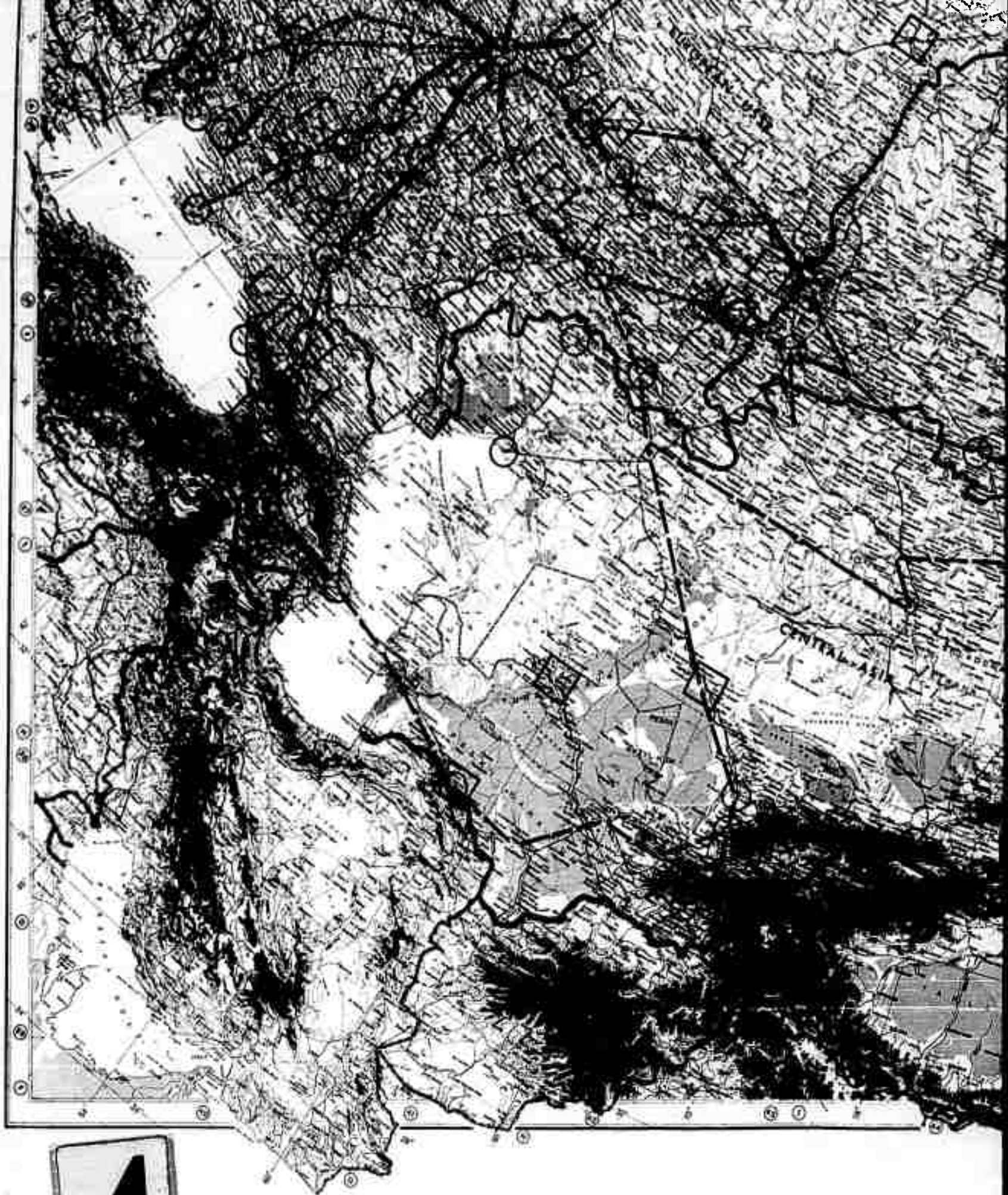
GENERAL DESCRIPTION MAP

FOR SYMBOLS, SEE
ENCLOSED "GUIDE"



FOR SYMBOLOGY, SEE
ENCLOSED "GUIDE TO MAPS"





4



5



6

UNCLASSIFIED

UNCLASSIFIED